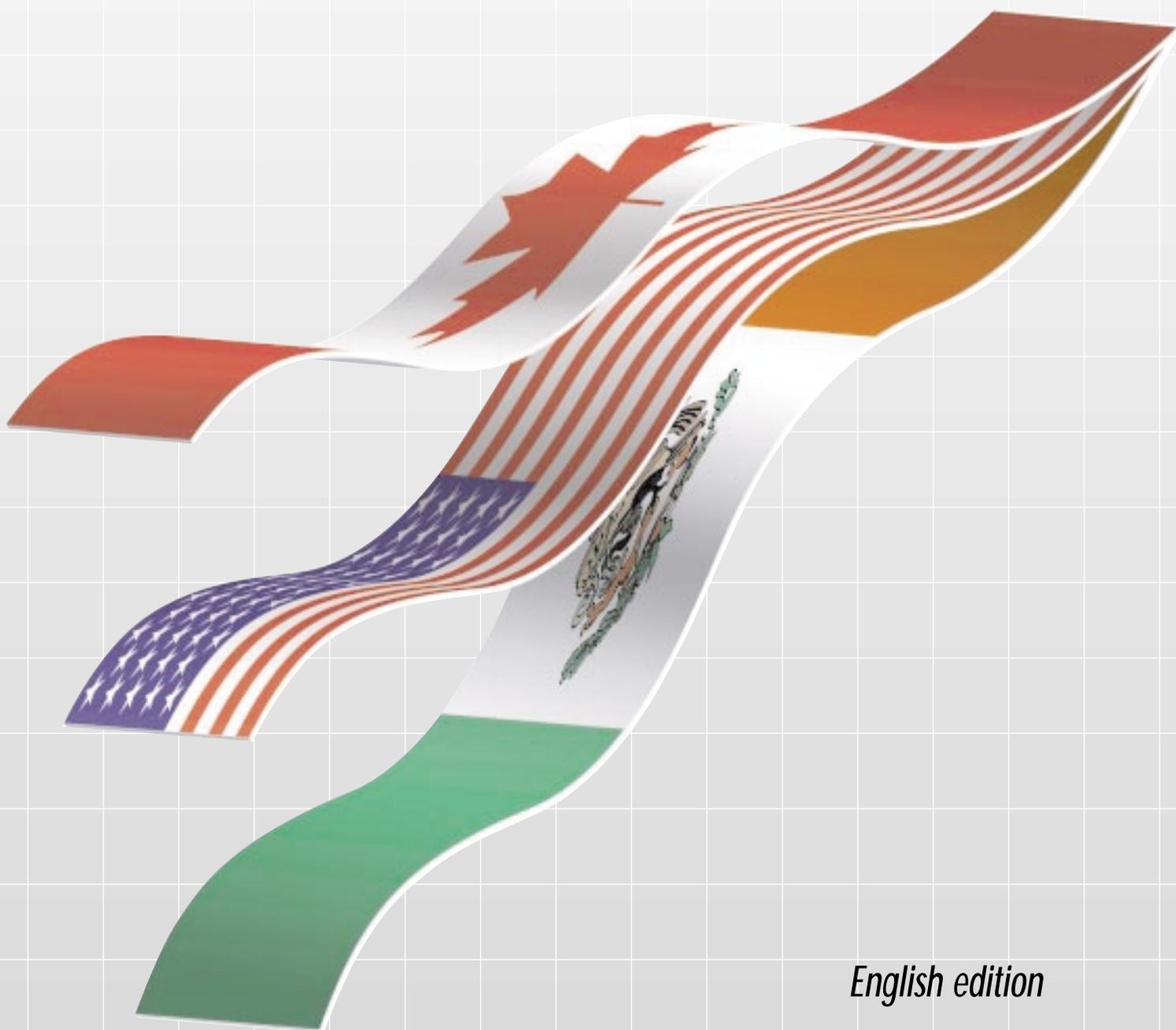


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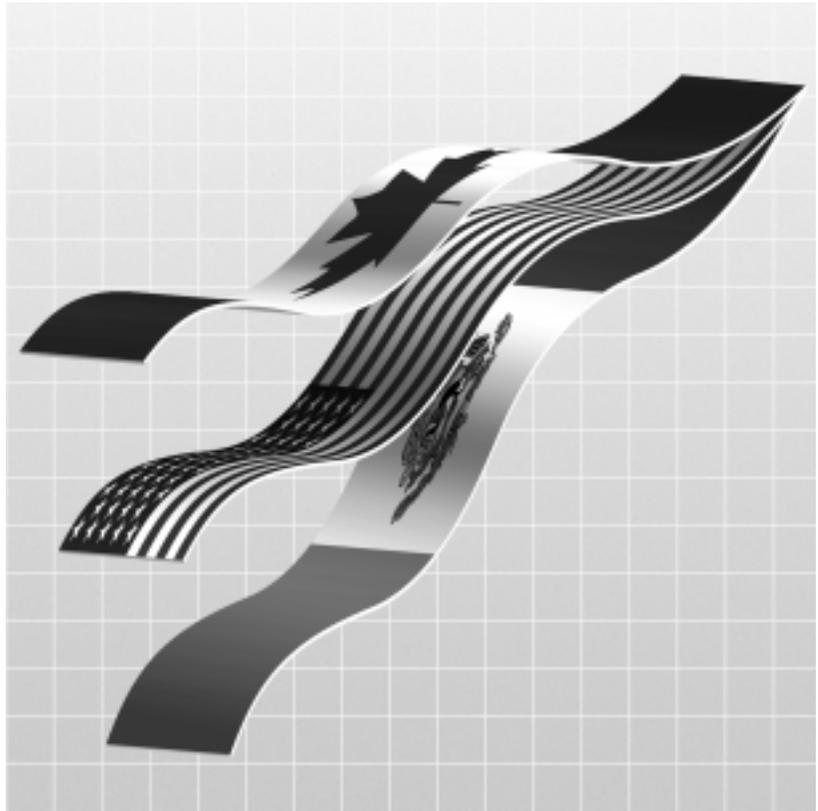
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# North American Transportation in Figures

BTS00-05



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## **North American Transportation Statistics Project**

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# p r e f a c e

*North American Transportation in Figures* examines transportation and transportation-related passenger, freight, economic, safety, energy, environmental and demographic statistics relating to Canada, Mexico and the United States. This publication serves to increase awareness of transportation-related statistics currently available in each of the three countries, helps to assess comparability of the data, determines where information gaps exist and reveals which additional data are needed for a more complete picture of transportation in North America.

This project is a direct result of the North American Transportation Statistics Interchange, a tripartite initiative representing the transportation and statistical agencies of Canada, Mexico and the United States. Updates to this publication will continue on a periodic basis.



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# I n t r o d u c t i o n

The rate of global economic growth and the integration of trade, finance and manufacturing have increased greatly over the last two decades. Transportation plays a vital role in the changing global economy, linking people and places, facilitating trade and tourism and encouraging economic competition and specialization. The North American<sup>1</sup> experience mirrors these worldwide trends. Reduced trade barriers and increasingly mobile populations have created a heightened need for information on transportation infrastructure and services within and across Canada, Mexico and the United States. Two major initiatives, the Canada-U.S. Free Trade Agreement (FTA)<sup>2</sup> and the subsequent North American Free Trade Agreement (NAFTA),<sup>3</sup> were significant milestones in the liberalization of trade in goods and services between the three countries of this continent.

An effective, efficient and safe transportation system is critical to any nation's economic growth, the mobility of its citizens and its national security. Each day, governments, businesses and consumers make countless decisions about where to locate facilities and make investments, what to ship, which transportation mode to use and how and where to travel on business or for pleasure. Transportation provides the links between businesses, industries and consumers, and the merits of transportation go beyond the national borders of any one country. While the positive contributions of transportation to the national economies and to the daily life of people everywhere are quite important,

transportation also has some adverse impacts. Transportation uses significant amounts of energy, mostly derived from petroleum, and is also a major cause of death and injury every year. This report strives to present a balanced picture of the benefits transportation confers as well as the impacts it has.

The effectiveness and efficiency of national and North American transportation relies heavily on sound information. Within and across countries, comprehensive transportation information makes knowledgeable decisions possible, on personal, corporate and national policy levels. Accurate data, comparable across modes and countries, is important in order to make effective investments with scarce resources; to understand changes in dynamic transportation markets; to evaluate transportation benefits and impacts; and to support critical decision-making in the public and private sectors. In short, accurate, comprehensive and timely transportation-related information is a key component in business, government and personal decisionmaking.

A trilateral initiative, the North American Transportation Statistics Interchange (Interchange), first identified a need for a compendium of transportation and transportation-related data for Canada, Mexico and the United States. The Interchange is an initiative between the transportation and statistical agencies of Canada, Mexico and the United States, and provides a forum for the exchange of information and for the discussion of topics and issues related to transportation statistics in and among the participating countries. The first Interchange meeting

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<sup>1</sup> For the purposes of this report, North America will refer to the countries of Canada, Mexico and the United States.

<sup>2</sup> The FTA entered into force on January 1, 1989.

<sup>3</sup> NAFTA entered into force on January 1, 1994.

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was held in November 1991, and regular meetings have been held since then.

In addition to promoting closer working ties between the transportation and statistical agencies of the three countries, the Interchange has led to a number of key projects, including: the joint Canadian and U.S. development of the Standard Classification of Transported Goods (SCTG), the resolution of data inconsistencies in transborder merchandise trade data and the exchange of ideas on the development of national reports. Trilateral cooperation between the three countries also led to the development of the North American Industrial Classification System (NAICS), provided for an exchange of ideas on how to improve and standardize the handling of transportation data in national economic accounts, and resulted in an agreement to jointly develop a project on North American transportation statistics. Since 1997, a tricountry working group has been coordinating the work of this later project. Participating agencies include Statistics Canada and Transport Canada from Canada; the Secretaría de Comunicaciones y Transportes (Ministry of Communications and Transportation), the Instituto Mexicano del Transporte (Mexican Institute of Transportation) and the Instituto Nacional de Estadística, Geografía e Informática (INEGI) (National Institute of Statistics, Geography and Informatics) from Mexico; and the Bureau of Transportation Statistics and the U.S. Census Bureau from the United States.

The North American Transportation Statistics project has had a number of key objectives. These are: (a) to identify key information that will help provide a comprehensive view of transportation in North America, (b) to characterize transportation activity and impacts across and between Canada, Mexico and

the United States, (c) to reveal specific data comparability differences within and across countries, (d) to identify data and information gaps and (e) to begin discussions for reducing comparability differences and data gaps through cooperative activities. This report, *North American Transportation in Figures*, is one of the outcomes of this project, and represents the second joint effort by the three countries to develop a statistical report related to transportation.<sup>4</sup> It is expected that the information will be updated on a periodic basis, giving users a recognized source for transportation and other related data in a North American context.

*North American Transportation in Figures* provides a comprehensive overview of transportation statistics in North America. English, French and Spanish editions of the report are available. The report includes data for 1990, 1995 and 1996, the latest years for which comparable data are readily available. All of the value data are reported in current U.S. dollars. All measurement units are in metric.<sup>5</sup> Users should note that, for the sake of greater comparability across the three countries, data categories and definitions were extensively reviewed and modified when necessary. Therefore, some of the data categories and definitions used in this report may not always correspond to those used in the specific national publications of Canada, Mexico and the United States. Users, who require data in original categories, currencies or measures, a complete time series or other

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<sup>4</sup> In December 1999, a brief summary report, *North American Transportation Highlights*, was published based on the work and data included in this report, *North American Transportation in Figures*.

<sup>5</sup> Conversion ratios to U.S. measures are included in Appendix C. Appendix D reports data in U.S. measures for specific tables.

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additional information, may contact the appropriate source agency in each country.

Each language edition of the report contains over 90 data tables, supported by graphs, figures, maps and a number of appendixes. Appendix A includes an overview of the transportation statistical system in each of the three countries, including information on specific agencies and their roles and responsibilities for transportation data. In most cases, Appendix A also provides web site addresses where additional detailed information is available for specific data sets and series. Appendix B provides additional technical notes for each of the data tables, and explains the differences in data sources, survey methodologies, collection approaches and definitions among the three countries. Information provided here supplements footnotes included on individual tables. Appendix C contains additional reference charts, including: the International Monetary Fund (IMF) exchange rates used, state and provincial abbreviations, U.S.-metric conversion ratios, land border crossing ports and the Harmonized Schedule for international merchandise trade at the two-digit level. Appendix D provides selected tables in U.S. measures.

*North American Transportation in Figures* contains twelve thematic sections. Section 1, Country Overview, sets the context of the report with an overview of each country: population, labor force, physical area and Gross Domestic Product (GDP). Section 2, Transportation and the Economy, draws a comprehensive picture of the impact that transportation has on the economic indicators of each country (including GDP), government expenditures for transportation, and transportation

employment. Section 3, Transportation Safety, provides critical information on fatalities and injuries by mode. Fatality and injury rates for road and air also are included. Section 4, Transportation, Energy and the Environment, responds to current energy and environmental concerns, and includes tables on energy consumption, fuel costs and emission control requirements. Section 5, Domestic Freight Activity, summarizes freight activity by mode, by major commodity and by major origin/destination pair. Sections 6 and 7 provide data on North American merchandise trade and international merchandise trade between North America and the rest of the world. For Section 6, each country decided to use its own merchandise trade data. Thus, there will be statistical differences when comparing, for example, Canada's data for trade with the United States and the United State's data for trade with Canada. Section 7 represents international merchandise trade for each country, excluding trade with the other North American countries. Sections 8, 9 and 10 provide data on domestic, North American and international passenger travel. Section 9 presents a picture of North American travel with information about the type of travel (overnight versus same-day), mode of transportation used and trip purpose. Section 10 provides data on international passenger travel between North America and the rest of the world. Section 11, concentrates on transportation infrastructure and its use in each country. Section 12, Transportation Vehicles, provides a detailed inventory of transportation vehicles and equipment and summarizes domestic movements, in terms of vehicle-kilometers, by mode.

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A number of standard symbols were adopted for use on the statistical tables. These are as follows:

- C = Data are confidential
- N = Data are nonexistent
- NA = Not applicable
- NS = Not significant
- U = Data are unavailable
- e = Data are estimated
- p = Data are preliminary
- r = Data are revised

In addition, the unit “billions” in this edition equates to “thousand millions” in the Spanish edition, and one milliard in the French edition.

An electronic version of *North American Transportation in Figures*, including downloadable spreadsheet files, also will be available on the web sites of the agencies involved in the North American Transportation Statistics project. The specific agency addresses are as follows:

### **Canada**

Statistics Canada  
[www.statcan.ca](http://www.statcan.ca)

Transport Canada  
[www.tc.gc.ca](http://www.tc.gc.ca)

### **Mexico**

Instituto Mexicano del Transporte (Mexican Institute of Transportation)  
[www.imt.mx](http://www.imt.mx)

Instituto Nacional de Estadística, Geografía e Informática (INEGI, National Institute of Statistics, Geography and Informatics)  
[www.inegi.gob.mx](http://www.inegi.gob.mx)

Secretaría de Comunicaciones y Transportes (Ministry of Communications and Transport)  
[www.sct.gob.mx](http://www.sct.gob.mx)

### **United States**

Bureau of Transportation Statistics,  
U.S. Department of Transportation  
[www.bts.gov](http://www.bts.gov)

U.S. Census Bureau,  
U.S. Department of Commerce  
[www.census.gov](http://www.census.gov)

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s e c t i o n 1

# Country Overview



**t a b l e 1-1**

# National Population and Labor Force

(Millions)

|  | Canada      |             |             | Mexico      |             |             | United States |                   |                   |
|--|-------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------------|-------------------|
|  | 1990        | 1995        | 1996        | 1990        | 1995        | 1997        | 1990          | 1995              | 1996              |
| <b>National population, total</b>          | <b>27.8</b> | <b>29.6</b> | <b>30.0</b> | <b>81.2</b> | <b>91.2</b> | <b>93.7</b> | <b>248.7</b>  | <b>262.9</b>      | <b>265.3</b>      |
| Females                                    | 14.0        | 14.9        | 15.1        | 41.3        | 46.3        | 48.0        | 127.5         | 134.3             | 135.5             |
| Males                                      | 13.8        | 14.7        | 14.9        | 39.9        | 44.9        | 45.7        | 121.2         | 128.5             | 129.8             |
| <b>Age structure</b>                       |             |             |             |             |             |             |               |                   |                   |
| Ages 14 and under                          | 5.8         | 6.0         | 6.0         | 31.1        | 32.3        | 32.7        | 53.5          | 57.2              | 57.7              |
| Percent of total population                | 20.9        | 20.3        | 20.0        | 38.3        | 35.4        | 34.9        | 21.5          | 21.8              | 21.8              |
| Ages 15-34                                 | 9.2         | 8.9         | 8.9         | 29.3        | 33.7        | 33.6        | 80.0          | 77.6              | 76.6              |
| Percent of total population                | 33.1        | 30.1        | 29.7        | 36.1        | 37.0        | 35.9        | 32.2          | 29.5              | 28.9              |
| Ages 35-64                                 | 9.7         | 11.1        | 11.5        | 16.9        | 20.9        | 22.8        | 83.9          | 94.7              | 97.1              |
| Percent of total population                | 34.9        | 37.5        | 38.3        | 20.8        | 22.9        | 24.3        | 33.7          | 36.0              | 36.6              |
| Ages 65+                                   | 3.1         | 3.6         | 3.6         | 3.9         | 4.3         | 4.6         | 31.2          | 33.4              | 33.8              |
| Percent of total population                | 11.1        | 12.1        | 12.0        | 4.8         | 4.7         | 4.9         | 12.6          | 12.7              | 12.7              |
| <b>Urban population</b>                    |             |             |             |             |             |             |               |                   |                   |
| Percent of urban population                | N           | N           | 77.9        | 71.3        | 73.5        | 74.0        | 79.7          | <sup>e</sup> 79.8 | <sup>e</sup> 79.8 |
| <b>Population density</b>                  |             |             |             |             |             |             |               |                   |                   |
| Number of people<br>(per square kilometer) | 3           | 3           | 3           | 41          | 46          | 48          | 27            | 29                | 29                |
| <b>Labor force, total</b>                  | <b>14.3</b> | <b>14.9</b> | <b>15.1</b> | <b>31.2</b> | <b>35.6</b> | <b>36.6</b> | <b>125.8</b>  | <b>132.3</b>      | <b>133.9</b>      |
| Percent of total population                | 51.4        | 50.3        | 50.3        | 37.5        | 39.0        | 39.6        | 50.6          | 50.3              | 50.5              |

**KEY:** e = Data are estimated. N = Data are nonexistent.

**SOURCES**

**Canada**

National population and labor force: Statistics Canada. *Annual Demographics Statistics, Catalogue No. 91-213-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

Urban population: Statistics Canada. 1996 Census of Population. *A national overview- population and dwelling counts, Catalogue No. 93-357-XPB*. (Ottawa, Ont.: 1997).

**Mexico**

National and urban population: Instituto Nacional de Estadística, Geografía e Informática. *XI Censo General de Población y Vivienda, 1990. Estados Unidos Mexicanos. Perfil Sociodemográfico*. (Aguascalientes, Ags.: 1992).

Instituto Nacional de Estadística, Geografía e Informática. *Conteo de Población y Vivienda, 1995. Estados Unidos Mexicanos. Resultados Definitivos. Tabulados Básicos*. (Aguascalientes, Ags.: 1996).

Instituto Nacional de Estadística, Geografía e Informática. *Conteo de Población y Vivienda, 1995. Estados Unidos Mexicanos. Perfil Sociodemográfico*. (Aguascalientes, Ags.: 1997).

Instituto Nacional de Estadística, Geografía e Informática. *Encuesta Nacional de la Dinámica Demográfica, 1997*. (Aguascalientes, Ags.: 1997).

Labor force: Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. *Encuesta Nacional de Empleo, 1991, 1995 and 1996*. (Aguascalientes, Ags.: various years).

**United States**

National population and age structure: U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States: 1998*. (Washington, DC: 1998).

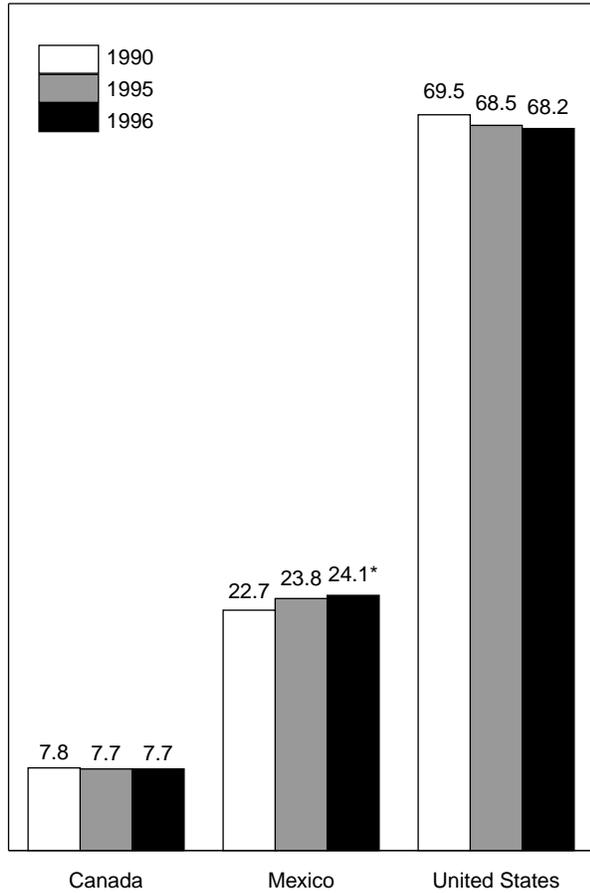
Urban population: U.S. Department of Commerce. U.S. Census Bureau. *Estimates of the Population of Metropolitan Areas: Annual Time Series, July 1, 1991, to July 1, 1996*. (Washington, DC: 1997).

Population density: U.S. Department of Commerce. U.S. Census Bureau. *State Population Estimates: Annual Time Series, July 1, 1990, to July 1, 1998*. (Washington, DC: 1998).

Labor force: U.S. Department of Commerce. U.S. Census Bureau and the Bureau of Labor Statistics. *Current Population Survey*. (Washington, DC: 1998).

**figure** 1-1a

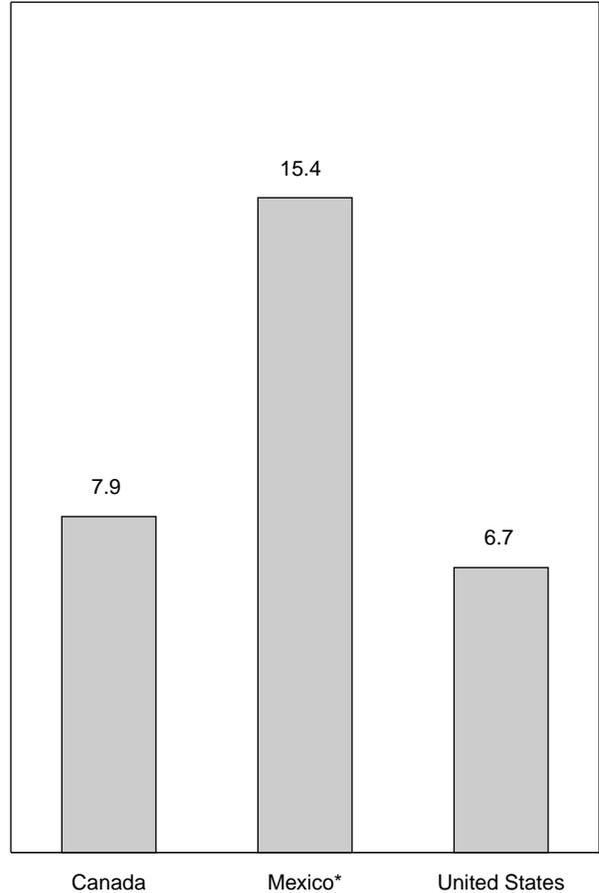
### Percent Share of North American Population: 1990, 1995 and 1996



\*Mexico's last data year is 1997.  
Notes and sources: See Table 1-1.

**figure** 1-1b

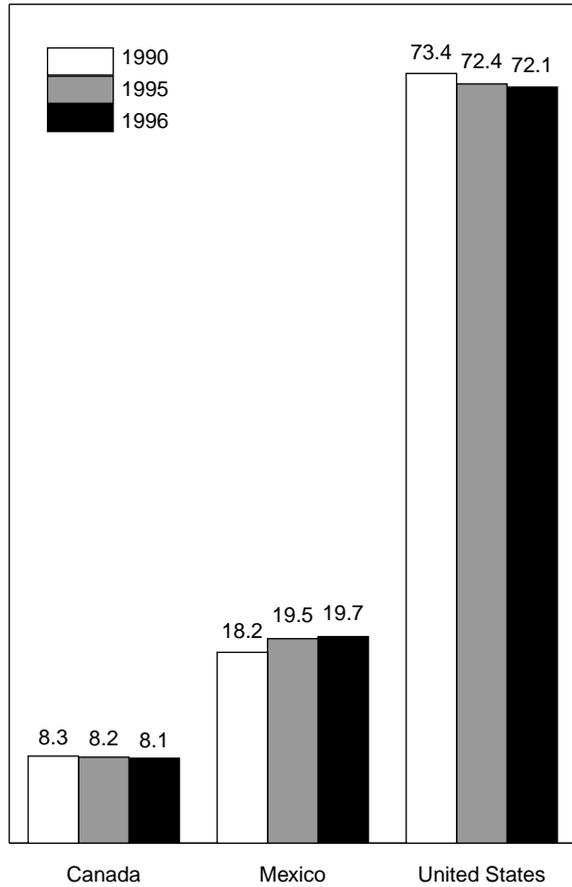
### Percent Change in Population: 1990 to 1996



\*Mexico's last data year is 1997.  
Notes and sources: See Table 1-1.

**figure** 1-1c

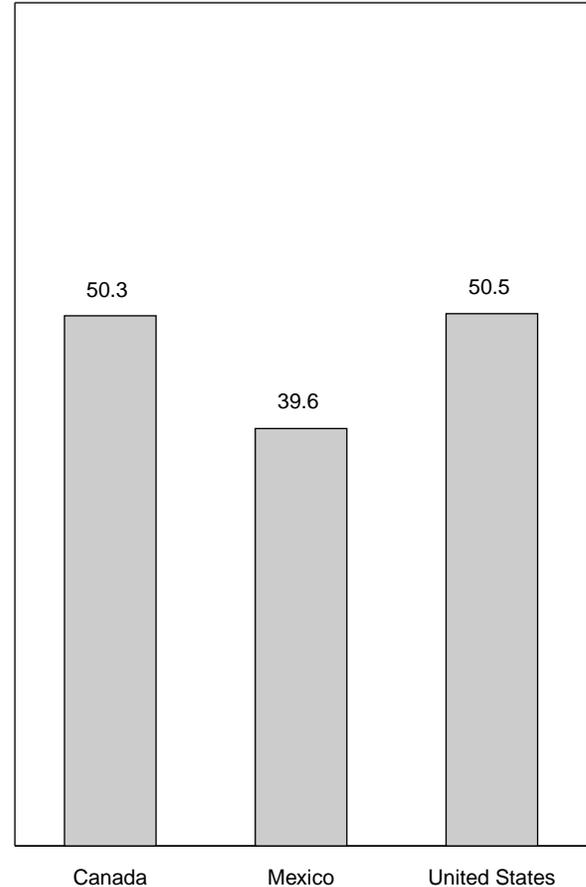
### Percent Share of North American Labor Force: 1990, 1995 and 1996



Notes and sources: See Table 1-1.

**figure** 1-1d

### Labor Force as a Percent of Total National Population: 1996



Notes and sources: See Table 1-1.

**t a b l e** 1-1a

## Top 25 Canadian Population Centers: 1996

(Thousands)

| Metropolitan area       | 1996  | Metropolitan area                           | 1996          |
|-------------------------|-------|---|---------------|
| Toronto, Ont.           | 4,445 | Windsor, Ont.                               | 292           |
| Montréal, Que.          | 3,359 | Oshawa, Ont.                                | 281           |
| Vancouver, B.C.         | 1,891 | Saskatoon, Sask.                            | 222           |
| Ottawa, Ont.-Hull, Que. | 1,031 | Regina, Sask.                               | 199           |
| Edmonton, Alta.         | 892   | St. John's, Nfld.                           | 178           |
| Calgary, Alta.          | 852   | Chicoutimi-Jonquière, Que.                  | 167           |
| Québec, Que.            | 698   | Sudbury, Ont.                               | 166           |
| Winnipeg, Man.          | 677   | Sherbrooke, Que.                            | 150           |
| Hamilton, Ont.          | 650   | Trois-Rivières, Que.                        | 144           |
| London, Ont.            | 416   | Saint John, N.B.                            | 129           |
| Kitchener, Ont.         | 403   | Thunder Bay, Ont.                           | 131           |
| St. Catherines, Ont.    | 390   | <b>Total of top 25</b>                      | <b>18,421</b> |
| Halifax, H.S.           | 347   | <b>Percent of total Canadian population</b> | <b>61.5</b>   |
| Victoria, B.C.          | 313   |   |               |

**SOURCE:** Statistics Canada. *Annual Demographics Statistics, Catalogue No. 91-213-XPB*. (Ottawa, Ont.: 1998).

**t a b l e** 1-1b

## Top 25 Mexican Population Centers: 1995

(Thousands)

| Metropolitan area                       | 1995   | Metropolitan area                          | 1995          |
|---|--------|--|---------------|
| Mexico City, D.F. (MZ)                  | 16,674 | Acapulco de Juárez, Gro. (City)            | 687           |
| Guadalajara, Jal. (MZ)                  | 3,462  | Querétaro, Qro. (MZ)                       | 680           |
| Monterrey, N.L. (MZ)                    | 3,022  | Cuernavaca, Mor. (MZ)                      | 672           |
| Puebla, Pue. (MZ)                       | 1,562  | Aguascalientes, Ags. (MZ)                  | 637           |
| León, Gto. (MZ)                         | 1,174  | Chihuahua, Chih. (MZ)                      | 628           |
| Toluca, Edo. de Méx. (MZ)               | 1,080  | Coatzacoalcos, Ver. (MZ)                   | 594           |
| Ciudad Juárez, Chih. (MZ)               | 1,012  | Saltillo, Coah. (MZ)                       | 583           |
| Tijuana, B.C. (City)                    | 992    | Morelia, Mich. (MZ)                        | 578           |
| Torreón, Coah.-Gómez Palacio, Dgo. (MZ) | 871    | Orizaba, Ver. (MZ)                         | 567           |
| San Luis Potosí, S.L.P. (MZ)            | 782    | Veracruz, Ver. (MZ)                        | 560           |
| Mérida, Yuc. (MZ)                       | 780    | Hermosillo, Son. (City)                    | 559           |
| Tampico, Tamps. (MZ)                    | 719    | <b>Total of top 25</b>                     | <b>40,267</b> |
| Culiacán, Sin. (City)                   | 696    | <b>Percent of total Mexican population</b> | <b>44.1</b>   |
| Mexicali, B.C. (City)                   | 696    |  |               |

**NOTE:** For definitions and explanations of city and MZ (metropolitan zone), see Appendix B.

**SOURCE:** Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Estadísticas del Medio Ambiente, 1997*. (Aguascalientes, Ags.: 1998).

**t a b l e** 1-1c

## Top 25 U.S. Population Centers: 1996

(Thousands)

| Metropolitan area                        | 1996   | Metropolitan area                       | 1996           |
|--|--------|---|----------------|
| New York, NY-NJ-CT-PA (CMSA)             | 19,938 | Minneapolis-St. Paul, MN-WI (MSA)       | 2,765          |
| Los Angeles, CA (CMSA)                   | 15,495 | Phoenix-Mesa, AZ (MSA)                  | 2,747          |
| Chicago, IL-IN-WI (CMSA)                 | 8,600  | San Diego, CA (MSA)                     | 2,655          |
| Washington-Baltimore, DC-MD-VA-WV (CMSA) | 7,165  | St. Louis, MO-IL (MSA)                  | 2,548          |
| San Francisco-Oakland, CA (CMSA)         | 6,605  | Pittsburgh, PA (MSA)                    | 2,747          |
| Philadelphia, PA-NJ-DE-MD (CMSA)         | 5,973  | Denver, CO (CMSA)                       | 2,277          |
| Boston, MA-NH-ME-CT (CMSA)               | 5,563  | Tampa, FL (MSA)                         | 2,199          |
| Detroit, MI (CMSA)                       | 5,284  | Portland, OR-WA (CMSA)                  | 2,078          |
| Dallas-Ft. Worth, TX (CMSA)              | 4,575  | Cincinnati, OH-KY-IN (CMSA)             | 1,921          |
| Houston, TX (CMSA)                       | 4,253  | Kansas City, MO-KS (MSA)                | 1,690          |
| Atlanta, GA (MSA)                        | 3,541  | Milwaukee, WI (CMSA)                    | 1,643          |
| Miami-Ft. Lauderdale, FL (CMSA)          | 3,514  | <b>Total of top 25</b>                  | <b>122,010</b> |
| Seattle-Tacoma, WA (CMSA)                | 3,321  | <b>Percent of total U.S. population</b> | <b>45.9</b>    |
| Cleveland-Akron, OH (CMSA)               | 2,913  |   |                |

**NOTE:** For definitions and explanations of MSA (metropolitan statistical area) and CMSA (consolidated metropolitan statistical area), see Appendix B.

**SOURCE:** U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States: 1998*. (Washington, DC: 1998).

**t a b l e** 1-2

## Area

(Number of square kilometers)

|                   | Canada           | Mexico           | United States    |
|-------------------|------------------|------------------|------------------|
| <b>Total area</b> | <b>9,970,610</b> | <b>2,173,375</b> | <b>9,629,091</b> |
| Land area         | 9,215,430        | 1,959,248        | 9,158,960        |
| Water area        | 755,180          | 214,127          | 470,131          |

**SOURCES**

**Canada**

Natural Resources Canada. GeoAccess Division. (Ottawa, Ont.: 1998).

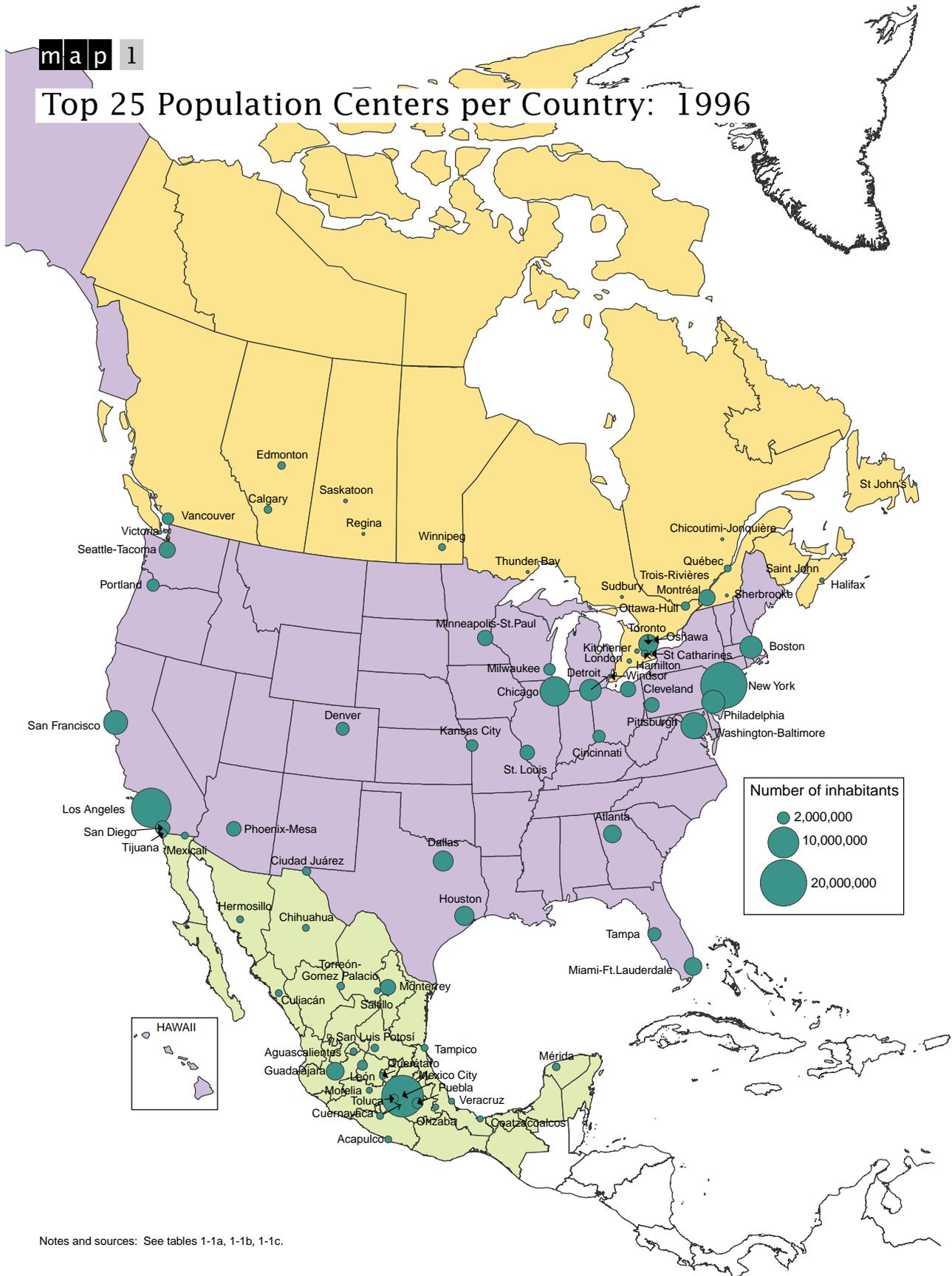
**Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Geografía. (Aguascalientes, Ags.: 1998).

**United States**

U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States: 1998*. (Washington, DC: 1998).

# Top 25 Population Centers per Country: 1996



Notes and sources: See tables 1-1a, 1-1b, 1-1c.

**t a b l e 1-3**

# Gross Domestic Product by Industry

(Current value, billions (or thousand millions) of U.S. dollars)

|                                    | Canada       |              |              | Mexico       |              |              | United States  |                |                |
|------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|----------------|----------------|
|                                    | 1990         | 1995         | 1996         | 1990         | 1995         | 1996         | 1990           | 1995           | 1996           |
| <b>Total</b>                       | <b>540.1</b> | <b>545.9</b> | <b>568.7</b> | <b>240.4</b> | <b>261.5</b> | <b>302.2</b> | <b>5,743.8</b> | <b>7,269.6</b> | <b>7,661.6</b> |
| Agriculture, forestry and fishing  | 12.4         | 14.1         | 15.2         | 18.9         | 14.3         | 18.4         | 108.7          | 109.5          | 130.4          |
| Mining                             | 23.8         | 21.3         | 25.5         | 5.6          | 4.5          | 4.7          | 112.3          | 98.7           | 113.8          |
| Construction                       | 41.7         | 28.9         | 30.2         | 9.4          | 10.6         | 12.6         | 245.2          | 286.4          | 311.9          |
| Manufacturing                      | 91.6         | 100.8        | 104.2        | 50.0         | 54.5         | 65.1         | 1,031.4        | 1,282.2        | 1,309.1        |
| <b>Transportation</b>              | <b>18.3</b>  | <b>18.9</b>  | <b>19.3</b>  | <b>19.0</b>  | <b>21.8</b>  | <b>26.1</b>  | <b>176.4</b>   | <b>226.1</b>   | <b>237.0</b>   |
| Trucking, warehousing and storage  | 7.7          | 8.7          | 8.6          | 9.7          | 9.4          | 11.3         | 75.8           | 98.0           | 92.9           |
| Railroad                           | 2.6          | 2.3          | 2.5          | 0.8          | 0.5          | 0.5          | 19.6           | 22.9           | 23.4           |
| Water                              | 1.6          | 1.4          | 1.3          | 0.7          | 0.7          | 0.7          | 9.7            | 10.9           | 11.7           |
| Pipeline, excluding natural gas    | 0.6          | 0.6          | 0.6          | U            | U            | U            | 5.0            | 4.9            | 5.2            |
| Air                                | 3.2          | 3.2          | 3.4          | 0.4          | 0.7          | 0.9          | 39.4           | 53.9           | 65.2           |
| Local and interurban passenger     | 2.1          | 2.0          | 2.0          | 5.7          | 8.3          | 10.1         | 9.0            | 12.2           | 13.0           |
| Transportation services            | 0.7          | 0.7          | 0.7          | 1.6          | 2.1          | 2.5          | 17.8           | 23.2           | 25.5           |
| Communications                     | 15.2         | 15.4         | 16.1         | 2.9          | 4.4          | 4.7          | 146.6          | 193.3          | 207.5          |
| Utilities                          | 17.8         | 20.9         | 21.7         | 3.3          | 3.3          | 3.5          | 159.3          | 197            | 204.9          |
| Commerce                           | 62.9         | 58.3         | 60.5         | 48.4         | 42.2         | 51.5         | 870.8          | 1,132.4        | 1,192.8        |
| Wholesale trade                    | 29.3         | 28.6         | 30.0         | U            | U            | U            | 367.3          | 491.4          | 519.8          |
| Retail trade                       | 33.6         | 29.7         | 30.5         | U            | U            | U            | 503.5          | 641.0          | 673.0          |
| Finance, insurance and real estate | 88.2         | 97.3         | 101.4        | 29.1         | 34.0         | 38.0         | 1,025.2        | 1,362.3        | 1,448.6        |
| Services                           | 120.9        | 124.2        | 128.7        | 47.0         | 62.3         | 67.7         | 1,059.4        | 1,445.4        | 1,544.2        |
| Government                         | 47.2         | 46.0         | 45.7         | 6.9          | 9.4          | 10.0         | 792.5          | 962.7          | 993.7          |

**KEY:** p = Data are preliminary. U = Data are unavailable.

## NOTES

### All Countries

Industry Classification: The industry groupings included in this table are based on a modification of the 1987 U.S. Standard Industrial Classification (SIC) system. The North American Industry Classification System (NAICS), which went into effect for the reference year 1997 in Canada and the United States and in 1998 in Mexico, differs from the system used in this table. NAICS industry categories will allow for greater data comparability and consistency across the three countries.

Pipeline, excluding natural gas: For Canada and the United States, oil pipelines are included. Oil pipeline data for Mexico are included in both manufacturing and mining and cannot be separated from these categories.

Utilities: Include electricity, natural gas, water, sanitation and other utility services.

Transportation services: Includes services of travel agencies, tour operators, freight forwarders and brokers, rental services and other miscellaneous types of transportation services.

### United States

Total: The GDP total does not equal the sum of industry categories due to the statistical discrepancy reported in the source data but omitted in this table. For the exact amounts of these, see Appendix B.

## SOURCES

### Canada

Statistics Canada. Input-Output Division. Special tabulations. (Ottawa, Ont.: 1999).

### Mexico

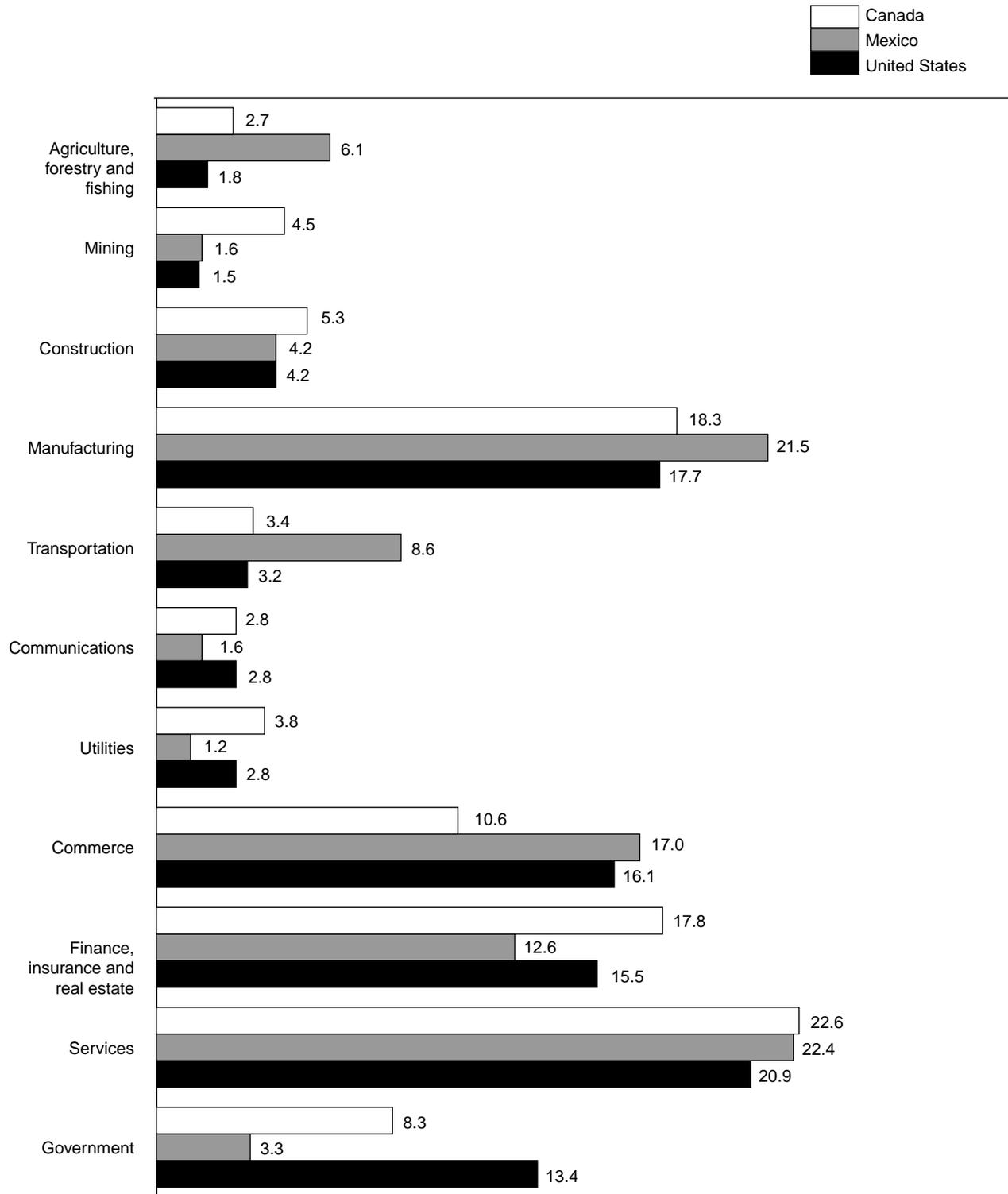
Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Aguascalientes, Ags: 1997).

### United States

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business*. (Washington, DC: August 1996 and January 1999).

**figure** 1-3a

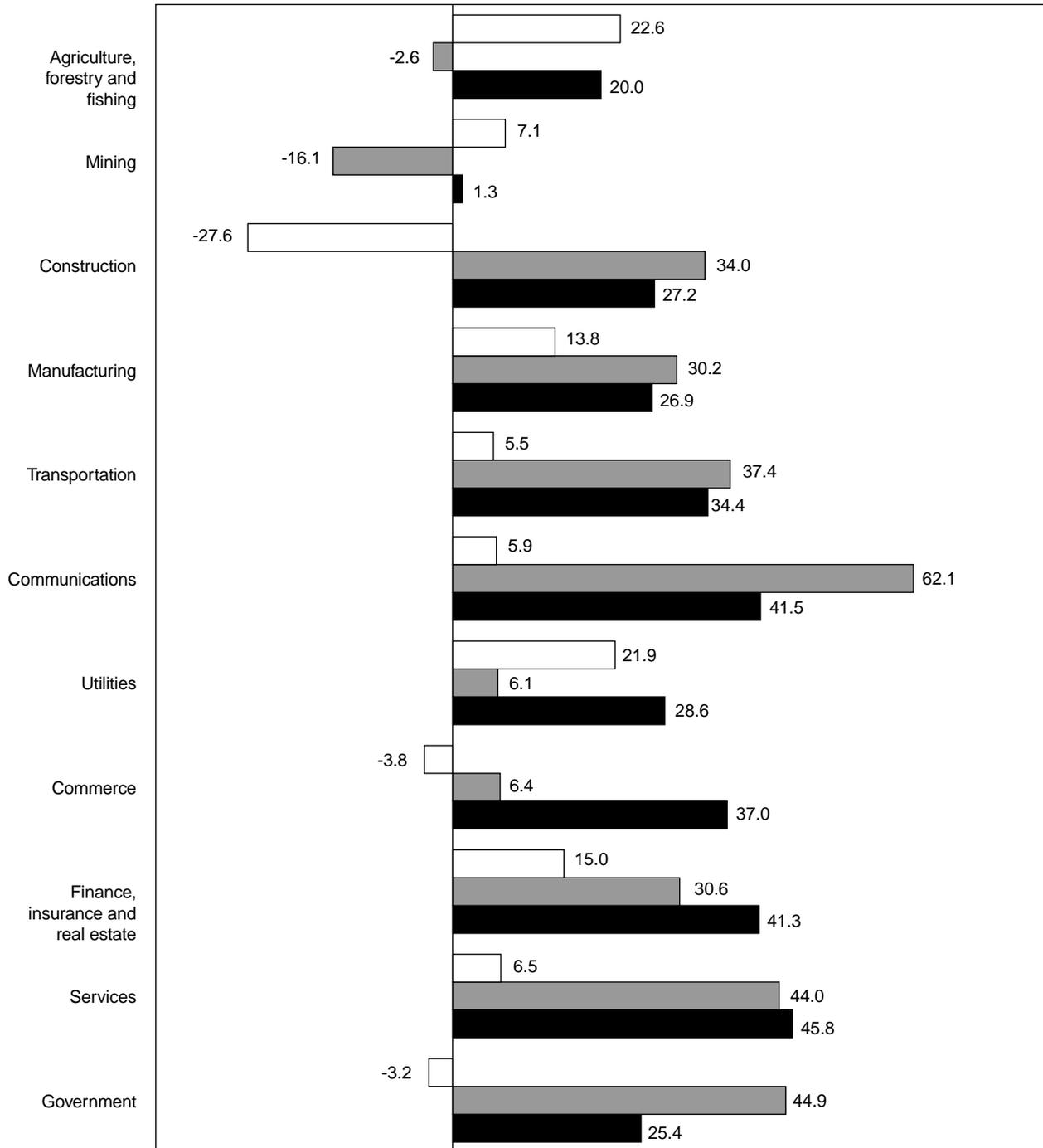
Percent Share of GDP Industry Category: 1996



Notes and sources: See Table 1-3.

**figure** 1-3b

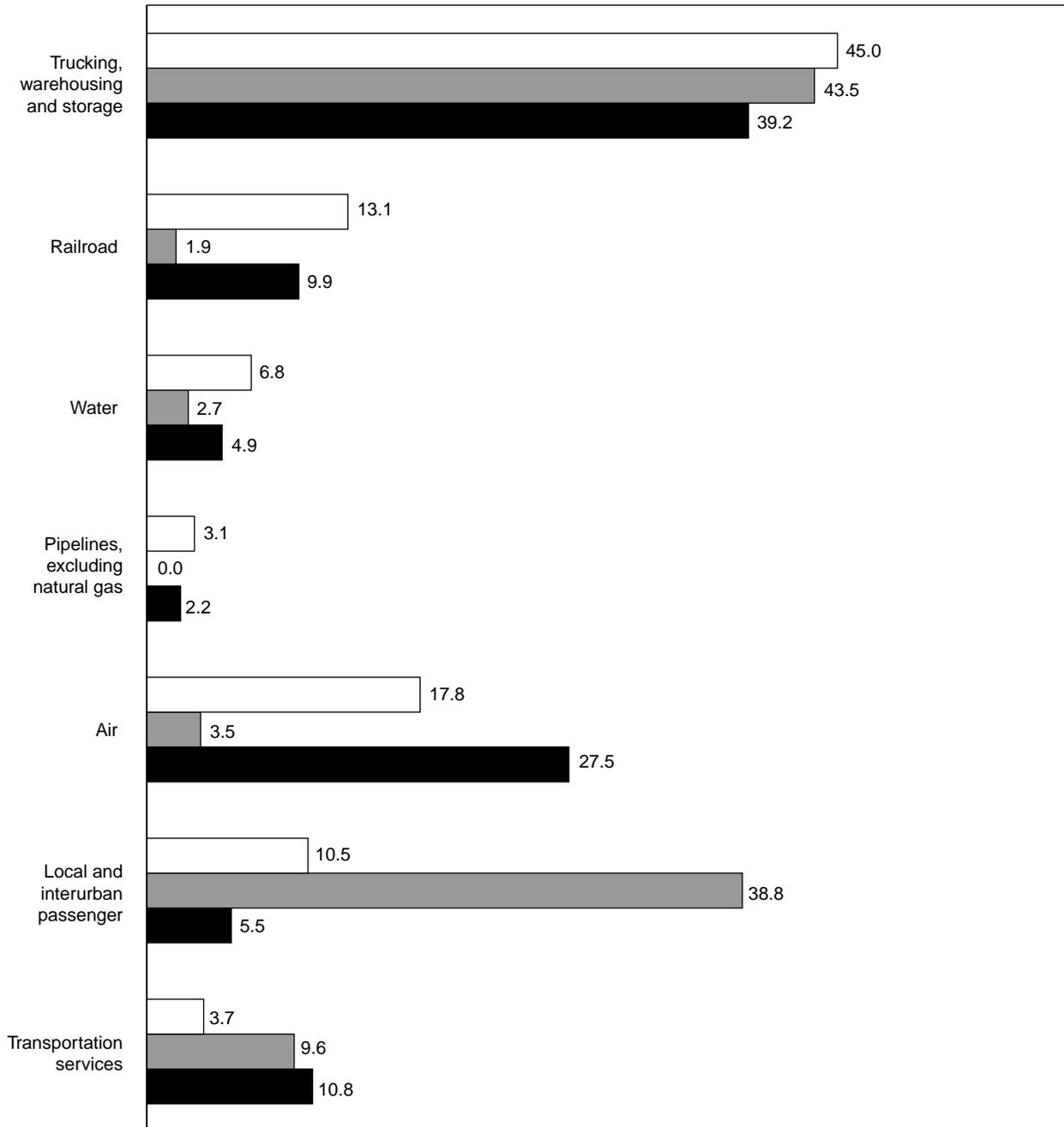
Percent Change in GDP Industry Category:  
1990 to 1996



Notes and sources: See Table 1-3.

**f i g u r e** 1-3c

# Percent Share of Transportation Industry GDP by Subcategory: 1996



Pipeline, excluding natural gas.  
Data for Mexico are included in both manufacturing and mining GDP industries, and cannot be separated from these categories.  
Notes and sources: See Table 1-3.

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s e c t i o n 2

Transportation and  
the Economy



**t a b l e** 2-1

## Gross Domestic Product (GDP) Attributed to Transportation-Related Final Demand

(Current value, billions (or thousand millions) of U.S. dollars)

|   | Canada       |              |                          | Mexico       |              |              | United States  |                   |                |
|---|--------------|--------------|--------------------------|--------------|--------------|--------------|----------------|-------------------|----------------|
|   | 1990         | 1995         | 1996                     | 1990         | 1995         | 1996         | 1990           | 1995 <sup>f</sup> | 1996           |
| <b>Personal consumption of transportation, total</b>            | <b>48.1</b>  | <b>45.4</b>  | <b>49.1</b>              | <b>24.7</b>  | <b>26.1</b>  | <b>32.2</b>  | <b>462.5</b>   | <b>574.1</b>      | <b>612.0</b>   |
| Road motor vehicles and parts <sup>a</sup>                      | 21.4         | 20.7         | 23.0                     | 7.7          | 6.3          | 8.2          | 204.6          | 247.4             | 256.4          |
| Motorcycles and other   | 0.9          | 0.8          | 0.8                      | U            | U            | U            | 5.0            | 7.9               | 8.7            |
| Motor fuel and lubricants                                       | 11.2         | 10.0         | 10.5                     | 5.8          | 5.0          | 6.0          | 109.3          | 115.6             | 124.5          |
| Transport services  | 14.6         | 13.9         | 14.8                     | 11.2         | 14.8         | 18.1         | 143.6          | 203.2             | 222.4          |
| <b>Gross private domestic investment, total</b>                 | <b>12.4</b>  | <b>11.1</b>  | <b>11.8</b>              | <b>U</b>     | <b>U</b>     | <b>U</b>     | <b>78.5</b>    | <b>130.6</b>      | <b>142.6</b>   |
| Transportation structures                                       | 2.3          | 1.8          | 2.3                      | U            | U            | U            | 3.0            | 4.4               | 5.4            |
| Transportation equipment  | 10.1         | 9.3          | 9.5                      | U            | U            | U            | 75.5           | 126.2             | 137.2          |
| <b>Exports (+), total</b>                                       | <b>39.7</b>  | <b>58.9</b>  | <b>61.3</b>              | <b>6.3</b>   | <b>14.6</b>  | <b>19.5</b>  | <b>106.7</b>   | <b>133.6</b>      | <b>143.2</b>   |
| Aircraft, engines and parts                                     | 4.2          | 4.7          | 5.5                      | 0.1          | 0.3          | 0.1          | 32.2           | 26.1              | 30.8           |
| Road motor vehicles, engines and parts                          | 32.1         | 49.3         | 50.5                     | 4.8          | 12.4         | 17.0         | 36.5           | 61.8              | 65.0           |
| Passenger fares   | 1.5          | 1.7          | 1.9                      | 0.4          | 0.7          | 0.8          | 15.3           | 18.9              | 20.4           |
| Other transportation  | 1.9          | 3.2          | 3.4                      | 1.0          | 1.2          | 1.6          | 22.7           | 26.8              | 27             |
| <b>Imports (-), total</b>                                       | <b>35.8</b>  | <b>47.9</b>  | <b>49.4</b>              | <b>9.7</b>   | <b>12.2</b>  | <b>13.5</b>  | <b>134.7</b>   | <b>176.6</b>      | <b>185.1</b>   |
| Aircraft, engines and parts                                     | 2.8          | 2.9          | 3.6                      | 0.1          | 0.0          | 0.1          | 10.5           | 10.7              | 12.7           |
| Road motor vehicles, engines and parts                          | 29.6         | 40.8         | 41.3                     | 5.8          | 7.6          | 8.4          | 88.5           | 123.8             | 128.9          |
| Passenger fares   | 2.7          | 2.8          | 3.1                      | 0.5          | 0.4          | 0.6          | 10.5           | 14.7              | 15.8           |
| Other transportation  | 0.7          | 1.4          | 1.4                      | 3.3          | 4.1          | 4.4          | 25.2           | 27.4              | 27.7           |
| <b>Net exports of transportation-related goods and services</b> | <b>3.9</b>   | <b>11.0</b>  | <b>11.9</b>              | <b>-3.4</b>  | <b>2.4</b>   | <b>6.0</b>   | <b>-28.0</b>   | <b>-43.0</b>      | <b>-41.9</b>   |
| <b>Government transportation-related purchases, total</b>       | <b>7.7</b>   | <b>7.1</b>   | <b>6.4</b>               | <b>U</b>     | <b>U</b>     | <b>U</b>     | <b>110.6</b>   | <b>136.6</b>      | <b>143.3</b>   |
| Federal purchases   | 0.6          | 0.3          | 0.2                      | U            | U            | U            | 14.6           | 18.1              | 18.9           |
| State/province and local purchases                              | 5.7          | 5.7          | 5.3                      | U            | U            | U            | 87.1           | 110.0             | 115.5          |
| Defense related purchases                                       | 1.4          | 1.1          | 0.9                      | U            | U            | U            | 8.9            | 8.5               | 8.9            |
| <b>Transportation-related final demand, total</b>               | <b>72.0</b>  | <b>74.6</b>  | <b>79.2</b>              | <b>22.7</b>  | <b>30.0</b>  | <b>40.2</b>  | <b>623.6</b>   | <b>798.3</b>      | <b>856.0</b>   |
| <b>Gross domestic product</b>                                   | <b>540.1</b> | <b>545.9</b> | <b><sup>p</sup>568.7</b> | <b>240.4</b> | <b>261.5</b> | <b>302.2</b> | <b>5,743.8</b> | <b>7,269.6</b>    | <b>7,661.6</b> |
| <b>Transportation in GDP, total (percent)</b>                   | <b>13.4</b>  | <b>13.6</b>  | <b>13.9</b>              | <b>U</b>     | <b>U</b>     | <b>U</b>     | <b>10.9</b>    | <b>11.0</b>       | <b>11.2</b>    |

<sup>a</sup>Excludes boats, noncommercial trailers and aircraft.

**KEY:** p = Data are preliminary. r = Data are revised. U = Data are unavailable.

### NOTES

#### Mexico

Road motor vehicles and parts: Data include motorcycles which cannot be disaggregated into a separate category.

Motorcycles and other: Data are unavailable as motorcycles are included in the category, road motor vehicles and parts and cannot be further disaggregated.

Transportation related final demand: Excludes data for government purchases and gross private domestic investment.

Transportation in GDP: The total percent of transportation in GDP was not calculated due to the unavailability of data for government and private sector purchases.

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**t a b l e 2-1****Gross Domestic Product (GDP) Attributed to  
Transportation-Related Final Demand—Continued****SOURCES****Canada**

Statistics Canada. Input-Output Division. Special tabulations. (Ottawa, Ont.: 1998).

**Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Aguascalientes, Ags: 1997).

**United States**

U.S. Department of Transportation. Bureau of Transportation Statistics, April 1999 based on data from the U.S. Department of Commerce. Bureau of Economic Analysis. *Historical Data Tables*. (Washington, DC: 1990).

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business* and special tabulations. (Washington, DC: 1998).

**t a b l e** 2-2

## Personal Consumption Expenditures on Transportation by Subcategory of Expenditure

(Current value, millions of U.S. dollars)

|   | Canada        |               |               | Mexico        |               |               | United States  |                   |                |
|---|---------------|---------------|---------------|---------------|---------------|---------------|----------------|-------------------|----------------|
|   | 1990          | 1995          | 1996          | 1990          | 1995          | 1996          | 1990           | 1995 <sup>r</sup> | 1996           |
| <b>Transportation, total</b>                              | <b>48,100</b> | <b>45,700</b> | <b>49,300</b> | <b>24,673</b> | <b>26,110</b> | <b>32,241</b> | <b>462,500</b> | <b>574,100</b>    | <b>612,000</b> |
| <b>User-operated transportation, total<sup>a</sup></b>    | <b>40,100</b> | <b>38,200</b> | <b>41,500</b> | <b>13,437</b> | <b>11,334</b> | <b>14,170</b> | <b>426,200</b> | <b>531,800</b>    | <b>567,600</b> |
| Personal road motor vehicles, new and used                | 18,500        | 17,900        | 20,100        | 3,623         | 1,726         | 3,252         | 180,200        | 219,100           | 226,600        |
| New and used passenger cars                               | 14,500        | 13,600        | 14,800        | U             | U             | U             | 124,000        | 139,600           | 141,600        |
| New and used trucks                                       | 3,100         | 3,500         | 4,500         | U             | U             | U             | 51,200         | 71,600            | 76,300         |
| New and used motorcycles and other motor vehicles         | 900           | 800           | 800           | U             | U             | U             | 5,000          | 7,900             | 8,700          |
| Parts and accessories of road motor vehicles              | 3,800         | 3,700         | 3,800         | 3,777         | 4,299         | 4,596         | 29,400         | 36,200            | 38,500         |
| Repair and rental   | 4,600         | 4,200         | 4,300         | 283           | 284           | 308           | 87,300         | 128,700           | 143,700        |
| Repair  | 4,100         | 3,900         | 4,000         | U             | U             | U             | 73,500         | 92,400            | 98,000         |
| Rental  | 500           | 300           | 300           | U             | U             | U             | 13,800         | 36,300            | 45,700         |
| Motor fuel and lubricants                                 | 11,200        | 10,000        | 10,500        | 5,753         | 5,024         | 6,015         | 109,300        | 115,600           | 124,500        |
| Tolls   | 100           | 100           | 100           | U             | U             | U             | 2,000          | 2,800             | 2,800          |
| Insurance premium, less claims paid                       | 1,900         | 2,300         | 2,700         | U             | U             | U             | 18,000         | 29,400            | 31,500         |
| <b>Purchased intercity transportation, total</b>          | <b>6,500</b>  | <b>6,000</b>  | <b>6,300</b>  | <b>5,362</b>  | <b>8,748</b>  | <b>10,791</b> | <b>28,500</b>  | <b>33,100</b>     | <b>34,400</b>  |
| Intercity passenger rail                                  | 200           | 100           | 100           | 31            | 9             | 11            | 800            | 800               | 800            |
| Intercity bus   | 300           | 200           | 200           | 3,118         | 6,983         | 8,316         | 1,000          | 1,100             | 1,100          |
| Air   | 4,300         | 4,000         | 4,200         | 1,473         | 1,017         | 1,484         | 23,900         | 27,900            | 28,500         |
| Other   | 1,700         | 1,700         | 1,800         | 740           | 739           | 978           | 2,800          | 3,300             | 4,000          |
| <b>Purchased local and suburban transportation, total</b> | <b>1,500</b>  | <b>1,500</b>  | <b>1,500</b>  | <b>5,874</b>  | <b>6,029</b>  | <b>7,280</b>  | <b>7,800</b>   | <b>9,200</b>      | <b>10,000</b>  |
| Mass transit system                                       | 1,100         | 1,100         | 1,100         | 1,551         | 1,367         | 1,801         | 5,200          | 6,000             | 6,500          |
| Taxi  | 400           | 400           | 400           | 4,323         | 4,662         | 5,479         | 2,600          | 3,200             | 3,500          |

<sup>a</sup>Excludes motor vehicles used primarily for recreation.

**KEY:** r = Data are revised. U = Data are unavailable.

### NOTES

#### All Countries

Purchased local and suburban transportation, mass transit system: Includes purchases for subway, local bus and other transit fares.

#### Mexico

Data refer to household spending.

### SOURCES

#### Canada

Statistics Canada. Input-Output Division. Special tabulations. (Ottawa, Ont.: 1998).

#### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Aguascalientes, Agu: 1997).

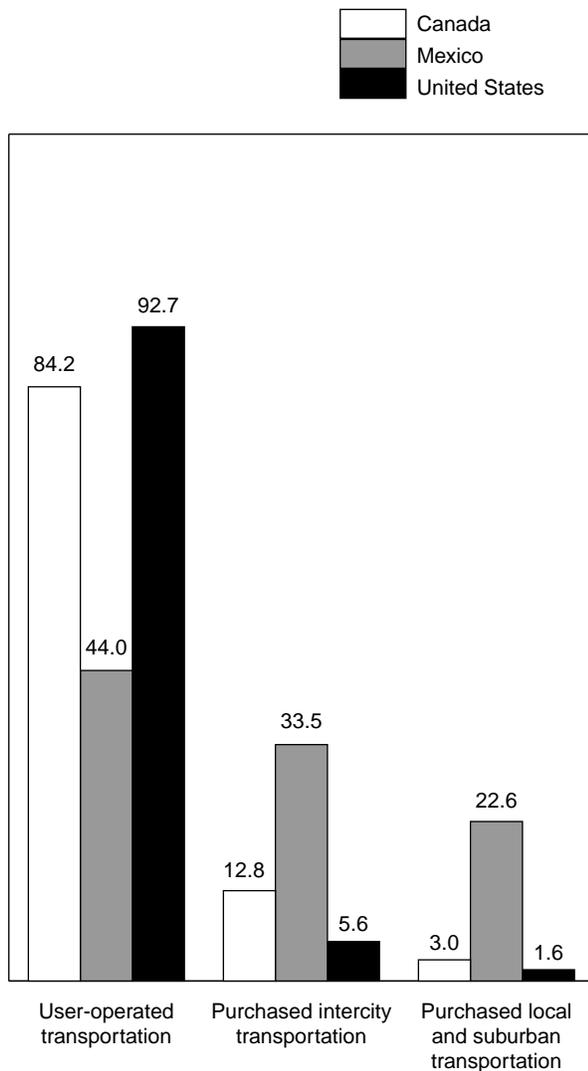
#### United States

U.S. Department of Transportation. Bureau of Transportation Statistics, April 1999 based on data from the U.S. Department of Commerce. Bureau of Economic Analysis. *Historical Data Tables*. (Washington, DC: 1990).

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business* and special tabulations. (Washington, DC: 1998).

**figure** 2-2a

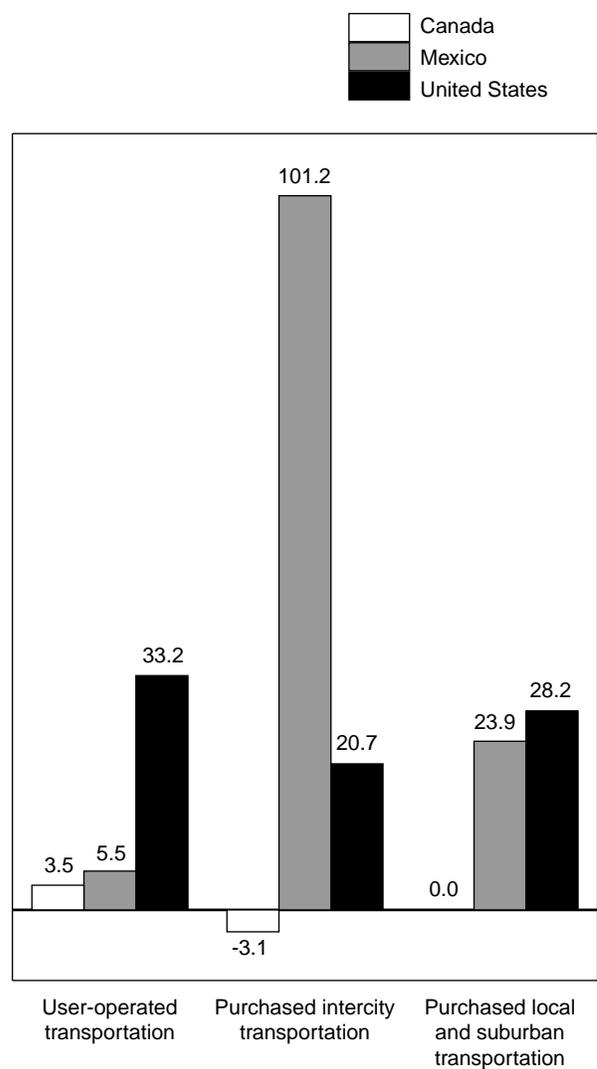
### Percent Share of Personal Consumption Expenditures for Transportation by Major Subcategory: 1996



Notes and sources: See Table 2-2.

**figure** 2-2b

### Percent Change in Personal Consumption Expenditures for Transportation by Major Subcategory: 1990 to 1996



Notes and sources: See Table 2-2.

**t a b l e** 2-3

## Government Expenditures for Transportation by Mode<sup>a</sup>

(Current value, millions of U.S. dollars)

|   | Canada          |                |                | Mexico         |              |                | United States   |                  |                  |
|---|-----------------|----------------|----------------|----------------|--------------|----------------|-----------------|------------------|------------------|
|   | 1990            | 1995           | 1996           | 1990           | 1995         | 1996           | 1990            | 1995             | 1996             |
| <b>Government<sup>a</sup> expenditures, total</b> | <b>N</b>        | <b>N</b>       | <b>N</b>       | <b>N</b>       | <b>N</b>     | <b>N</b>       | <b>96,404.0</b> | <b>123,073.2</b> | <b>124,531.5</b> |
| <b>Air</b>  | <b>1,433.8</b>  | <b>1,155.6</b> | <b>1,216.7</b> | <b>136.5</b>   | <b>210.0</b> | <b>171.0</b>   | <b>10,983.0</b> | <b>14,209.5</b>  | <b>14,222.8</b>  |
| Infrastructure                                    | N               | N              | N              | 52.2           | 39.6         | 54.5           | 3,111.0         | 3,289.1          | 3,317.5          |
| Equipment   | N               | N              | N              | 0.0            | 0.0          | 0.0            | 988.0           | 1,392.3          | 1,364.1          |
| Current operations                                | N               | N              | N              | 84.3           | 170.4        | 116.5          | 6,884.0         | 9,528.1          | 9,541.2          |
| <b>Water transport</b>                            | <b>397.8</b>    | <b>233.5</b>   | <b>330.5</b>   | <b>157.1</b>   | <b>70.8</b>  | <b>93.1</b>    | <b>4,294.0</b>  | <b>4,813.4</b>   | <b>4,878.0</b>   |
| Infrastructure                                    | N               | N              | N              | 46.5           | 41.1         | 49.1           | 968.0           | 958.1            | 1,030.4          |
| Equipment   | N               | N              | N              | 46.8           | 0.0          | 0.0            | 341.0           | 648.5            | 639.4            |
| Current operations                                | N               | N              | N              | 63.8           | 29.7         | 44.0           | 2,985.0         | 3,206.8          | 3,208.2          |
| <b>Pipeline, oil and gas</b>                      | <b>6.1</b>      | <b>2.6</b>     | <b>0.0</b>     | <b>U</b>       | <b>U</b>     | <b>U</b>       | <b>27</b>       | <b>42</b>        | <b>46</b>        |
| Infrastructure                                    | N               | N              | N              | U              | U            | U              | NA              | NA               | NA               |
| Equipment   | N               | N              | N              | U              | U            | U              | NA              | NA               | NA               |
| Current operations                                | N               | N              | N              | U              | U            | U              | NA              | NA               | NA               |
| <b>Rail</b>                                       | <b>1,607.8</b>  | <b>1,518.3</b> | <b>414.1</b>   | <b>1,023.4</b> | <b>519.8</b> | <b>585.2</b>   | <b>541.0</b>    | <b>1,043.0</b>   | <b>1,189.0</b>   |
| Infrastructure                                    | N               | N              | N              | 460.6          | 256.0        | 186.6          | U               | U                | U                |
| Equipment   | N               | N              | N              | 14.1           | 179.5        | 180.1          | U               | U                | U                |
| Current operations                                | N               | N              | N              | 548.7          | 84.3         | 218.5          | U               | U                | U                |
| Intercity passenger rail                          | N               | N              | N              | U              | U            | U              | U               | U                | U                |
| Freight rail                                      | N               | N              | N              | U              | U            | U              | NA              | NA               | NA               |
| <b>Transit rail</b>                               | <b>N</b>        | <b>N</b>       | <b>N</b>       | <b>U</b>       | <b>U</b>     | <b>U</b>       | <b>18,788.0</b> | <b>25,201.8</b>  | <b>25,777.5</b>  |
| Infrastructure                                    | N               | N              | N              | U              | U            | U              | 2,891.0         | 5,393.3          | 6,155.6          |
| Equipment   | N               | N              | N              | U              | U            | U              | 2,552.0         | 2,113.9          | 1,828.0          |
| Current operations                                | N               | N              | N              | U              | U            | U              | 13,345.0        | 17,694.6         | 17,793.9         |
| <b>Road</b>                                       | <b>10,154.5</b> | <b>8,902.5</b> | <b>8,595.4</b> | <b>654.9</b>   | <b>892.2</b> | <b>1,295.3</b> | <b>61,771.0</b> | <b>77,763.5</b>  | <b>78,418.2</b>  |
| Infrastructure                                    | N               | N              | N              | 613.6          | 826.0        | 1,204.9        | 29,502.0        | 37,445.8         | 37,964.0         |
| Equipment   | N               | N              | N              | 0.0            | 0.0          | 0.0            | 4,546.0         | 5,425.4          | 5,418.0          |
| Current operations                                | N               | N              | N              | 41.3           | 66.2         | 90.4           | 27,723.0        | 34,892.3         | 35,036.2         |

<sup>a</sup>Government refers to local, state or provincial and federal levels of government, unless otherwise noted.

**KEY:** N = Data are nonexistent. NA = Not applicable. U = Data are unavailable.

### NOTES

#### Mexico

Road: Includes federal government expenditures on Mexico's federal highways.

#### United States

Total: Data represent the sum of the subcategories in this table.

Pipeline and freight rail: Detailed subcategory data are not applicable because expenditures for these two modes are primarily by the private sector.

Intercity passenger rail: Federal payments to the National Railroad Passenger Corporation (Amtrak) were \$806 million in 1995, according to the 1997 U.S. budget. These payments are not included in this table because, as subsidies, they do not fall into any of the three expenditure categories in the table.

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**t a b l e 2-3****Government Expenditures for Transportation by Mode<sup>a</sup>—Continued****SOURCES****Canada**

Statistics Canada. Public Institutions Division. Special tabulations. (Ottawa, Ont.: 1999).

**Mexico**

1990: Secretaría de Programación y Presupuesto. *Cuenta de la Hacienda Pública Federal, 1990*. (Mexico City, D.F.: 1991).

1995-96: Secretaría de Hacienda y Crédito Público. *Cuenta de la Hacienda Pública Federal, 1995 and 1996*. (Mexico City, D.F.: 1996 and 1997).

**United States**

U.S. Department of Transportation, Bureau of Transportation Statistics, April 1999 based on data from the U.S. Department of Commerce. U.S. Census Bureau. *Government Finances: 1989-90*. (Washington, DC: 1990).

U.S. Department of Commerce. U.S. Census Bureau. Web site: [www.census.gov/govs](http://www.census.gov/govs)

U.S. Department of Transportation, Bureau of Transportation Statistics. *Government Transportation Financial Statistics*. (Washington, DC: 1997).

**t a b l e** 2-4

## Employment in Transportation and Related Industries

(Thousands of employees)

|   | Canada          |                 |                 | Mexico        |               |                 | United States  |                |                |
|---|-----------------|-----------------|-----------------|---------------|---------------|-----------------|----------------|----------------|----------------|
|   | 1990            | 1995            | 1996            | 1990          | 1995          | 1996            | 1990           | 1995           | 1996           |
| <b>Employed labor force, total</b>                        | <b>11,369</b>   | <b>10,876</b>   | <b>10,967</b>   | <b>25,958</b> | <b>27,348</b> | <b>28,282</b>   | <b>118,793</b> | <b>124,900</b> | <b>126,708</b> |
| <b>Transportation labor force</b>                         | <b>1,176</b>    | <b>1,051</b>    | <b>1,068</b>    | <b>1,652</b>  | <b>1,741</b>  | <b>1,910</b>    | <b>9,685</b>   | <b>9,579</b>   | <b>10,125</b>  |
| <b>Transport sectors</b>                                  | <b>500</b>      | <b>447</b>      | <b>442</b>      | <b>1,332</b>  | <b>1,407</b>  | <b>1,513</b>    | <b>3,293</b>   | <b>3,636</b>   | <b>4,034</b>   |
| Air   | 61              | 53              | 56              | 23            | 20            | 21              | 745            | 788            | 1,122          |
| Trucking, warehousing and storage                         | 158             | 152             | 159             | 553           | 553           | 608             | 1,391          | 1,583          | 1,641          |
| Trucking  | 145             | 136             | 141             | 536           | 536           | 593             | 1,274          | 1,440          | 1,484          |
| Warehousing and storage                                   | 13              | 16              | 18              | 17            | 17            | 15              | 117            | 143            | 152            |
| Local and intercity passenger transport                   | 92              | 77              | 77              | 589           | 673           | 709             | 338            | 424            | 440            |
| Intercity and rural                                       | <sup>e</sup> 4  | <sup>e</sup> 4  | <sup>e</sup> 3  | 117           | 154           | 160             | 26             | 24             | 26             |
| Local and suburban transit systems                        | <sup>e</sup> 23 | <sup>e</sup> 17 | <sup>e</sup> 16 | 122           | 124           | 135             | 141            | 203            | 217            |
| School bus  | <sup>e</sup> 39 | <sup>e</sup> 39 | <sup>e</sup> 38 | U             | U             | U               | 111            | 134            | 133            |
| Taxi  | N               | N               | N               | 350           | 395           | 414             | 32             | 32             | 31             |
| Other local and intercity                                 | <sup>e</sup> 3  | <sup>e</sup> 2  | <sup>e</sup> 3  | U             | U             | U               | 28             | 31             | 33             |
| Railroad  | 69              | 53              | 51              | 35            | 19            | 20              | 279            | 239            | 231            |
| Water   | 17              | 18              | 18              | 34            | 29            | 28              | 177            | 174            | 173            |
| Pipeline  | 9               | 8               | 7               | U             | U             | U               | 18             | 15             | 15             |
| Transportation services                                   | 107             | 102             | 92              | 98            | 113           | 127             | 345            | 413            | 417            |
| <b>Transportation vehicle and equipment manufacturing</b> | <b>243</b>      | <b>230</b>      | <b>247</b>      | <b>255</b>    | <b>215</b>    | <b>229</b>      | <b>2,539</b>   | <b>2,460</b>   | <b>2,464</b>   |
| Aircraft and parts  | 45              | 37              | 40              | 6             | 5             | 5               | 712            | 449            | 460            |
| Road motor vehicles, equipment, parts and accessories     | 150             | 154             | 160             | 193           | 176           | 188             | 1,278          | 1,563          | 1,565          |
| Road motor vehicles and equipment                         | 50              | 53              | 54              | U             | U             | U               | 812            | 968            | 963            |
| Parts and accessories, road motor vehicles                | 87              | 88              | 92              | N             | N             | N               | 400            | 516            | 530            |
| Truck, bus bodies and trailers                            | 13              | 13              | 14              | N             | N             | N               | 66             | 79             | 73             |
| Railroad equipment  | 7               | 10              | 9               | 28            | 14            | 14              | 33             | 37             | 36             |
| Ship/boat building and repair                             | 17              | 7               | 10              | 5             | 2             | 4               | 188            | 159            | 157            |
| Tires and tubes   | 22              | 22              | 24              | 16            | 13            | 14              | 84             | 80             | 80             |
| Other transportation equipment                            | 2               | C               | 4               | 7             | 5             | 5               | 244            | 172            | 166            |
| <b>Related industries, total<sup>a</sup></b>              | <b>420</b>      | <b>358</b>      | <b>379</b>      | <b>65</b>     | <b>119</b>    | <b>169</b>      | <b>3,180</b>   | <b>3,382</b>   | <b>3,523</b>   |
| Auto repair services                                      | 71              | 70              | 70              | U             | U             | U               | 914            | 1,020          | 1,084          |
| Gasoline service stations                                 | 113             | 69              | 65              | U             | U             | U               | 647            | 647            | 670            |
| Highway and street construction                           | 65              | 47              | 51              | 65            | 119           | 169             | 239            | 227            | 235            |
| Road motor vehicle wholesalers                            | 61              | 64              | 65              | U             | U             | U               | 456            | 492            | 502            |
| New and used car and light truck dealers                  | 110             | 108             | 110             | U             | U             | U               | 924            | 996            | 1,032          |
| <b>Government employment, total</b>                       | <b>N</b>        | <b>N</b>        | <b>N</b>        | <b>U</b>      | <b>U</b>      | <b>U</b>        | <b>673</b>     | <b>101</b>     | <b>99</b>      |
| Federal departments of transportation                     | <sup>e</sup> 21 | <sup>e</sup> 19 | <sup>e</sup> 13 | 47            | 42            | <sup>b</sup> 75 | 104            | 101            | 99             |
| State/province and local                                  | N               | N               | N               | U             | U             | U               | 569            | U              | U              |

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**t a b l e 2-4****Employment in Transportation and Related Industries—Continued**

<sup>a</sup>Employment data for related industries includes nontransportation occupations.

<sup>b</sup>Mexican data for 1996 includes part-time positions for work on the rural road program of the Secretaría de Comunicaciones y Transportes.

**KEY:** e = Data are estimated. C = Data are confidential. N = Data are nonexistent. U = Data are unavailable.

**NOTES****All Countries**

Data are based on annual averages. U.S. and Canadian data are based on the number of employees. Mexican data are based on the number of full-time positions.

**Mexico**

Federal Departments of Transportation: Labor force includes number of positions in the area of communications and in the area of transportation for the Secretaría de Comunicaciones y Transportes. It is not possible to further separate the Secretaría de Comunicaciones y Transportes employment data.

**SOURCES****Canada**

Statistics Canada. *Employment, Earnings and Hours—Payrolls and Hours, Catalogue No. 72-002-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue No. 53-215-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

Transport Canada. *Transportation in Canada 1997—Annual Report*. (Ottawa, Ont.: 1998).

**Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988 - 1996*. (Aguascalientes, Ags: 1997).

Poder Ejecutivo Federal. *Informe de Gobierno, various years*. (Mexico City, D.F.: various years).

**United States**

Employed labor force, total: U.S. Department of Labor. Bureau of Labor Statistics. *Household Data Annual Averages, 1998*.

Web site: [www.stats.bls.gov](http://www.stats.bls.gov)

Private employment (Transport sectors, transportation vehicle and equipment manufacturing and related industries): U.S. Department of Transportation. Bureau of Transportation Statistics, April 1999, special tabulation based on data from:

U.S. Department of Labor. Bureau of Labor Statistics. *National Employment, Hours and Earnings, United States, 1988-1996*. (Washington, DC: various years).

U.S. Department of Labor. Bureau of Labor Statistics. *National Employment, Hours and Earnings, United States, June 1997*. (Washington, DC: 1997).

Government employment: U.S. Department of Transportation. Office of the Secretary. *DOT Workforce Facts and DOT Employment Facts*. (Washington, DC: various years).

U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States: 1998*. (Washington, DC: 1998).

**t a b l e** 2-5

## Employment in Transportation-Related Occupations

(Thousands of employees)

|   | Canada        |               |               | Mexico        |               |               | United States  |                |                |
|---|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|
|   | 1990          | 1995          | 1996          | 1990          | 1995          | 1996          | 1990           | 1995           | 1996           |
| <b>Employed labor force, total</b>  | <b>11,276</b> | <b>11,370</b> | <b>11,410</b> | <b>25,958</b> | <b>27,348</b> | <b>28,282</b> | <b>118,793</b> | <b>124,900</b> | <b>126,708</b> |
| <b>Workers in transportation occupations, total</b>                       | <b>418</b>    | <b>430</b>    | <b>429</b>    | <b>N</b>      | <b>N</b>      | <b>N</b>      | <b>3,980</b>   | <b>4,258</b>   | <b>4,406</b>   |
| <b>Transportation occupations (percent of total national labor force)</b> | <b>3.7</b>    | <b>3.8</b>    | <b>3.8</b>    | <b>N</b>      | <b>N</b>      | <b>N</b>      | <b>3.4</b>     | <b>3.4</b>     | <b>3.5</b>     |
| <b>Road motor vehicle operators, total</b>                                | <b>351</b>    | <b>368</b>    | <b>374</b>    | <b>N</b>      | <b>N</b>      | <b>N</b>      | <b>3,560</b>   | <b>3,850</b>   | <b>3,978</b>   |
| Supervisors   | 7             | 8             | 7             | N             | N             | N             | 76             | 87             | 85             |
| Truck drivers   | 234           | 224           | 237           | N             | N             | N             | 2,627          | 2,860          | 3,019          |
| Drivers-sales workers   | N             | N             | N             | N             | N             | N             | 201            | 158            | 156            |
| Bus drivers   | 57            | 66            | 61            | N             | N             | N             | 443            | 526            | 512            |
| Taxi cab drivers and chauffeurs   | 18            | 17            | 16            | 350           | 395           | 414           | 208            | 211            | 203            |
| Other   | 35            | 53            | 53            | N             | N             | N             | 5              | 8              | 4              |
| <b>Rail transportation, total</b>   | <b>24</b>     | <b>23</b>     | <b>18</b>     | <b>N</b>      | <b>N</b>      | <b>N</b>      | <b>118</b>     | <b>104</b>     | <b>116</b>     |
| Supervisors   | 6             | 2             | 2             | N             | N             | N             | N              | N              | N              |
| Conductors and yardmasters  | 7             | 8             | 7             | N             | N             | N             | 36             | 33             | 45             |
| Locomotive operations   | 6             | 8             | 6             | N             | N             | N             | 46             | 51             | 49             |
| Operating support   | 4             | 4             | 2             | N             | N             | N             | 28             | 17             | 15             |
| Other   | C             | C             | C             | N             | N             | N             | 8              | 3              | 7              |
| <b>Water transportation, total</b>  | <b>17</b>     | <b>14</b>     | <b>12</b>     | <b>N</b>      | <b>N</b>      | <b>N</b>      | <b>52</b>      | <b>66</b>      | <b>70</b>      |
| Deck officers, captains and mates   | 6             | 4             | 5             | N             | N             | N             | 26             | 33             | 32             |
| Deck crew   | 3             | 4             | 3             | N             | N             | N             | 18             | 26             | 25             |
| Engineering officers  | 4             | 2             | C             | N             | N             | N             | 2              | 3              | 8              |
| Bridge, lock and lighthouse   | N             | N             | N             | N             | N             | N             | 6              | 4              | 5              |
| Other   | 3             | 4             | 2             | N             | N             | N             | N              | N              | N              |
| <b>Air transportation, total</b>  | <b>21</b>     | <b>20</b>     | <b>20</b>     | <b>N</b>      | <b>N</b>      | <b>N</b>      | <b>250</b>     | <b>238</b>     | <b>241</b>     |
| Airplane pilots and navigators  | 10            | 11            | 10            | N             | N             | N             | 114            | 114            | 114            |
| Operating support   | 8             | 7             | 6             | N             | N             | N             | 136            | 124            | 127            |
| Air traffic controllers   | N             | N             | N             | N             | N             | N             | 36             | 30             | 32             |
| Service and flight attendants   | N             | N             | N             | N             | N             | N             | 100            | 94             | 95             |
| Other   | 3             | 3             | 3             | N             | N             | N             | N              | N              | N              |
| <b>Other transport operating</b>  | <b>5</b>      | <b>4</b>      | <b>4</b>      | <b>N</b>      | <b>N</b>      | <b>N</b>      | <b>N</b>       | <b>N</b>       | <b>N</b>       |

**KEY:** C = Data are confidential. N = Data are nonexistent. NA = Not applicable.

**NOTE:** Canadian and U.S. employment data are based on annual averages and represent the number of employees.

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**t a b l e 2-5****Employment in Transportation-Related Occupations—Continued****SOURCES****Canada**

Statistics Canada. *Historical Labor Force Statistics, Catalogue No. 71-201-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

**Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Mexico City, D.F.: 1997).

**United States**

Employed labor force: U.S. Department of Labor. Bureau of Labor Statistics. *Household Data Annual Averages*.

Web site: [www.stats.bls.gov](http://www.stats.bls.gov)

Transportation occupations: U.S. Department of Transportation. Bureau of Transportation Statistics, based on data from the U.S. Department of Labor. Bureau of Labor Statistics. *Employment and Earnings* and BLS underlying statistical details. (Washington, DC: various years).

**t a b l e** 2-6

## Receipts and Payments Related to International Merchandise and Services Trade (Balance of Payments Basis)

(Millions of current U.S. dollars)

|   | Canada         |                |                | Mexico        |               |                | United States  |                 |                 |
|---|----------------|----------------|----------------|---------------|---------------|----------------|----------------|-----------------|-----------------|
|   | 1990           | 1995           | 1996           | 1990          | 1995          | 1996           | 1990           | 1995            | 1996            |
| <b>Receipts from exports</b>                              |                |                |                |               |               |                |                |                 |                 |
| <b>Merchandise exports, total</b>                         | <b>127,687</b> | <b>191,130</b> | <b>202,300</b> | <b>40,711</b> | <b>79,542</b> | <b>96,000</b>  | <b>392,924</b> | <b>584,743</b>  | <b>625,075</b>  |
| Inland freight  | 3,668          | 5,049          | 4,955          | U             | U             | U              | N              | N               | N               |
| Other trade adjustments                                   | -1,028         | -3,200         | -2,083         | U             | U             | U              | -3,617         | -8,803          | -13,006         |
| Trade adjustments, total                                  | 2,640          | 1,848          | 2,872          | U             | U             | U              | -3,617         | -8,803          | -13,006         |
| <b>Export merchandise trade<br/>(balance of payments)</b> | <b>130,327</b> | <b>192,979</b> | <b>205,172</b> | <b>40,711</b> | <b>79,542</b> | <b>96,000</b>  | <b>389,307</b> | <b>575,940</b>  | <b>612,069</b>  |
| <b>Service exports, total</b>                             | <b>19,210</b>  | <b>26,396</b>  | <b>29,336</b>  | <b>15,360</b> | <b>17,488</b> | <b>19,494</b>  | <b>147,571</b> | <b>210,596</b>  | <b>236,768</b>  |
| <b>Transportation</b>                                     | <b>4,223</b>   | <b>5,240</b>   | <b>5,703</b>   | <b>893</b>    | <b>1,164</b>  | <b>1,412</b>   | <b>36,655</b>  | <b>44,743</b>   | <b>45,768</b>   |
| Air   | 893            | 875            | 925            | U             | U             | U              | 8,174          | 10,015          | 10,564          |
| Land <sup>a</sup>   | 990            | 1,673          | 1,945          | U             | U             | U              | 1,264          | 2,091           | 2,212           |
| Water   | 1,309          | 1,432          | 1,368          | U             | U             | U              | 11,919         | 13,512          | 12,435          |
| Passenger fares   | 1,032          | 1,260          | 1,465          | 441           | 668           | 775            | 15,298         | 19,125          | 20,557          |
| <b>Tourism and other services</b>                         | <b>14,987</b>  | <b>21,156</b>  | <b>23,633</b>  | <b>14,467</b> | <b>16,324</b> | <b>18,082</b>  | <b>110,916</b> | <b>165,851</b>  | <b>191,000</b>  |
| Tourism   | 6,360          | 7,911          | 8,614          | 5,526         | 6,179         | 6,934          | U              | U               | U               |
| Other services  | 8,627          | 13,245         | 15,019         | 8,941         | 10,145        | 11,148         | U              | U               | U               |
| <b>Receipts, total</b>                                    | <b>149,538</b> | <b>219,343</b> | <b>234,497</b> | <b>56,071</b> | <b>97,029</b> | <b>115,493</b> | <b>536,878</b> | <b>786,534</b>  | <b>848,837</b>  |
| <b>Payments for imports</b>                               |                |                |                |               |               |                |                |                 |                 |
| <b>Merchandise imports, total</b>                         | <b>116,738</b> | <b>164,364</b> | <b>170,670</b> | <b>41,593</b> | <b>72,453</b> | <b>89,469</b>  | <b>495,980</b> | <b>743,445</b>  | <b>795,289</b>  |
| Inland freight  | 3,236          | 3,173          | 3,395          | U             | U             | U              | 2,264          | 3,350           | 3,595           |
| Other trade adjustments                                   | 842            | 23             | 394            | U             | U             | U              | 93             | 2,569           | 4,355           |
| Trade adjustments, total                                  | 4,078          | 3,196          | 3,789          | U             | U             | U              | 2,357          | 5,919           | 7,950           |
| <b>Merchandise import trade<br/>(balance of payments)</b> | <b>120,817</b> | <b>167,560</b> | <b>174,459</b> | <b>41,593</b> | <b>72,453</b> | <b>89,469</b>  | <b>498,337</b> | <b>749,364</b>  | <b>803,239</b>  |
| <b>Services, total</b>                                    | <b>28,303</b>  | <b>33,844</b>  | <b>36,135</b>  | <b>21,929</b> | <b>26,153</b> | <b>28,355</b>  | <b>118,826</b> | <b>142,230</b>  | <b>156,634</b>  |
| <b>Transportation</b>                                     | <b>5,786</b>   | <b>8,042</b>   | <b>8,121</b>   | <b>1,132</b>  | <b>1,449</b>  | <b>1,669</b>   | <b>34,880</b>  | <b>41,772</b>   | <b>43,446</b>   |
| Air   | 906            | 1,112          | 1,268          | U             | U             | U              | 9,881          | 11,064          | 11,679          |
| Land <sup>a</sup>   | 884            | 1,546          | 1,578          | U             | U             | U              | 2,004          | 2,590           | 2,831           |
| Water   | 1,964          | 2,987          | 2,773          | U             | U             | U              | 12,464         | 13,685          | 13,160          |
| Passenger fares   | 2,031          | 2,398          | 2,502          | 475           | 416           | 576            | 10,531         | 14,433          | 15,776          |
| <b>Tourism and other services</b>                         | <b>22,518</b>  | <b>25,801</b>  | <b>28,014</b>  | <b>19,266</b> | <b>22,730</b> | <b>24,179</b>  | <b>83,946</b>  | <b>100,458</b>  | <b>113,188</b>  |
| Tourism   | 10,931         | 10,170         | 11,084         | 5,519         | 3,171         | 3,387          | U              | U               | U               |
| Other services  | 11,587         | 15,631         | 16,930         | 13,747        | 19,559        | 20,789         | U              | U               | U               |
| <b>Payments, total</b>                                    | <b>149,118</b> | <b>201,363</b> | <b>210,577</b> | <b>63,522</b> | <b>98,606</b> | <b>117,824</b> | <b>617,163</b> | <b>891,594</b>  | <b>959,873</b>  |
| <b>Balance</b>  | <b>420</b>     | <b>17,980</b>  | <b>23,920</b>  | <b>-7,451</b> | <b>-1,577</b> | <b>-2,331</b>  | <b>-80,285</b> | <b>-105,060</b> | <b>-111,036</b> |

<sup>a</sup>Land refers to trucking, rail and pipeline services, unless otherwise noted.**KEY:** N = Data are nonexistent. U = Data are unavailable.**NOTE:** Detailed data on merchandise trade commodities can be found in Sections 6 and 7.

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**t a b l e** 2-6**Receipts and Payments Related to International  
Merchandise and Services Trade**  
(Balance of Payments Basis)–*Continued***SOURCES****Canada**

Statistics Canada. *Canada's Balance of International Payments, Catalogue No. 67-001-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

**Mexico**

Banco de México. *Indicadores Económicos*. (Mexico City, D.F.: 1998).

**United States**

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business*. (Washington, DC: September 1993, July 1996 and October 1997).

U.S. Department of Commerce. Bureau of Economic Analysis. *1998 Annual Services Historical Disk*. (Washington, DC: 1998).

**t a b l e** 2-7a

## Canada's Receipts From and Payments to Mexico for Merchandise and Services Trade (Balance of Payments Basis)

(Millions of current U.S. dollars)

|  | 1990       | 1995          | 1996          |
|--|------------|---------------|---------------|
| <b>Receipts from exports to Mexico</b>           |            |               |               |
| Merchandise exports, total                       | 562        | 835           | 922           |
| Trade adjustments, total                         | NA         | NA            | NA            |
| Export merchandise trade (balance of payments)   | 562        | 835           | 922           |
| Services, total                                  | 71         | 105           | 159           |
| Transportation                                   | 1          | 7             | 7             |
| Air  | NA         | NA            | NA            |
| Land <sup>a</sup>                                | NA         | NA            | NA            |
| Water  | NA         | NA            | NA            |
| Passenger fares                                  | 1          | 7             | 7             |
| Tourism and other services                       | 71         | 105           | 159           |
| Tourism  | 42         | 48            | 59            |
| Other services                                   | 29         | 57            | 100           |
| <b>Receipts, total</b>                           | <b>634</b> | <b>947</b>    | <b>1,088</b>  |
| <b>Payments for imports from Mexico</b>          |            |               |               |
| Merchandise imports, total (customs-origin)      | 1,497      | 3,900         | 4,426         |
| Merchandise imports, total (customs-consignment) | NA         | 2,471         | 2,723         |
| Trade adjustments, total                         | NA         | NA            | NA            |
| Import merchandise trade (balance of payments)   | NA         | 2,471         | 2,723         |
| Services, total                                  | 349        | 302           | 338           |
| Transportation                                   | 8          | 4             | 6             |
| Air  | NA         | NA            | NA            |
| Land <sup>a</sup>                                | NA         | NA            | NA            |
| Water  | NA         | NA            | NA            |
| Passenger fares                                  | 8          | 4             | 6             |
| Tourism and other services                       | 349        | 302           | 338           |
| Tourism  | 320        | 256           | 268           |
| Other services                                   | 29         | 46            | 70            |
| <b>Payments, total</b>                           | <b>NA</b>  | <b>2,777</b>  | <b>3,067</b>  |
| <b>Balance</b>                                   | <b>NA</b>  | <b>-1,830</b> | <b>-1,979</b> |

<sup>a</sup>Land refers to trucking, rail and pipeline services, unless otherwise noted.**KEY:** NA = Not applicable.**NOTE:** Detailed data on North American merchandise trade commodities can be found in Section 6.**SOURCES**Statistics Canada. *Canada's Balance of International Payments, Catalogue No. 67-001-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

**t a b l e** 2-7b

## Canada's Receipts From and Payments to the United States for Merchandise and Services Trade (Balance of Payments Basis)

(Millions of current U.S. dollars)

|  | 1990           | 1995           | 1996           |
|--|----------------|----------------|----------------|
| <b>Receipts from exports to the United States</b>  |                |                |                |
| Merchandise exports, total                         | 95,610         | 151,410        | 163,706        |
| Trade adjustments, total                           | 8              | -1,547         | -648           |
| Export merchandise trade (balance of payments)     | 95,618         | 149,863        | 163,058        |
| Services, total                                    | 10,783         | 15,101         | 16,759         |
| Transportation                                     | 1,839          | 2,564          | 2,957          |
| Air  | 275            | 283            | 323            |
| Land <sup>a</sup>                                  | 990            | 1,673          | 1,945          |
| Water  | 319            | 304            | 298            |
| Passenger fares                                    | 256            | 304            | 392            |
| Tourism and other services                         | 8,944          | 12,537         | 13,801         |
| Tourism  | 3,637          | 4,406          | 4,750          |
| Other services                                     | 5,307          | 8,131          | 9,051          |
| <b>Receipts, total</b>                             | <b>106,402</b> | <b>164,964</b> | <b>179,816</b> |
| <b>Payments for imports from the United States</b> |                |                |                |
| Merchandise imports, total (customs-origin)        | 75,302         | 109,796        | 115,205        |
| Merchandise Imports, total (customs-consignment)   | 79,959         | 122,364        | 128,551        |
| Trade adjustments, total                           | 3,584          | 3,306          | 3,602          |
| Import merchandise trade (balance of payments)     | 83,544         | 125,670        | 132,154        |
| Services, total                                    | 17,934         | 20,705         | 22,646         |
| Transportation                                     | 2,418          | 3,200          | 3,318          |
| Air  | 266            | 305            | 370            |
| Land <sup>a</sup>                                  | 884            | 1,546          | 1,578          |
| Water  | 376            | 251            | 251            |
| Passenger fares                                    | 893            | 1,098          | 1,118          |
| Tourism and other services                         | 15,515         | 17,505         | 19,328         |
| Tourism  | 7,529          | 6,591          | 7,235          |
| Other services                                     | 7,987          | 10,914         | 12,093         |
| <b>Payments, total</b>                             | <b>101,478</b> | <b>146,375</b> | <b>154,800</b> |
| <b>Balance</b>                                     | <b>4,924</b>   | <b>18,589</b>  | <b>25,016</b>  |

<sup>a</sup>Land refers to trucking, rail and pipeline services, unless otherwise noted.**NOTE:** Detailed data on North American merchandise trade commodities can be found in Section 6.**SOURCES**Statistics Canada. *Canada's Balance of International Payments. Catalogue No. 67-001-XPB.* (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

**t a b l e** 2-8a

## U.S. Receipts From and Payments to Canada for Merchandise and Services Trade (Balance of Payments Basis)

(Millions of current U.S. dollars)

|  | 1990           | 1995            | 1996            |
|--|----------------|-----------------|-----------------|
| <b>Receipts from exports to Canada</b>         |                |                 |                 |
| Merchandise exports, total                     | 83,674         | 127,226         | 134,210         |
| Trade adjustments, total                       | -210           | 359             | 399             |
| Export merchandise trade (balance of payments) | 83,464         | 127,585         | 134,609         |
| Services, total                                | 16,605         | 18,247          | 19,951          |
| Transportation                                 | 2,800          | 3,807           | 4,051           |
| Air  | 290            | 346             | 420             |
| Land <sup>a</sup>                              | 1,259          | 2,087           | 2,208           |
| Water  | 272            | 90              | 92              |
| Passenger fares                                | 979            | 1,284           | 1,331           |
| Tourism and other services                     | 13,805         | 14,440          | 15,900          |
| Tourism  | U              | U               | U               |
| Other services                                 | U              | U               | U               |
| <b>Receipts, total</b>                         | <b>100,069</b> | <b>145,832</b>  | <b>154,560</b>  |
| <b>Payments for imports from Canada</b>        |                |                 |                 |
| Merchandise imports, total (customs value)     | 91,380         | 144,369         | 155,892         |
| Trade adjustments, total                       | U              | U               | U               |
| Import merchandise trade (balance of payments) | 93,098         | 148,087         | 158,640         |
| Services, total                                | 102,464        | 134,523         | 143,086         |
| Transportation                                 | 2,722          | 3,505           | 3,853           |
| Air  | 246            | 325             | 388             |
| Land <sup>a</sup>                              | 2,004          | 2,590           | 2,831           |
| Water  | 217            | 284             | 243             |
| Passenger fares                                | 255            | 306             | 391             |
| Tourism and other services                     | 99,742         | 131,018         | 139,233         |
| Tourism  | U              | U               | U               |
| Other services                                 | U              | U               | U               |
| <b>Payments, total</b>                         | <b>195,562</b> | <b>282,610</b>  | <b>301,726</b>  |
| <b>Balance</b>                                 | <b>-95,493</b> | <b>-136,778</b> | <b>-147,166</b> |

<sup>a</sup>Land refers to trucking, rail and pipeline services, unless otherwise noted.**KEY:** U = Data are unavailable.**NOTE:** Detailed data on North American merchandise trade commodities can be found in Section 6.**SOURCES**U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business*, September 1993, July 1996, and October 1997. (Washington, DC: various years).U.S. Department of Commerce. Bureau of Economic Analysis. *1998 Annual Services Historical Disk*. (Washington, DC: 1998).

**t a b l e** 2-8b

## U.S. Receipts From and Payments to Mexico for Merchandise and Services Trade (Balance of Payments Basis)

(Millions of current U.S. dollars)

|  | 1990          | 1995           | 1996           |
|--|---------------|----------------|----------------|
| <b>Receipts from exports to Mexico</b>         |               |                |                |
| Merchandise exports, total                     | 28,279        | 46,292         | 56,792         |
| Trade adjustments, total                       | -170          | -110           | -57            |
| Export merchandise trade (balance of payments) | 28,109        | 46,182         | 56,735         |
| Services, total                                | 7,880         | 7,294          | 7,927          |
| Transportation                                 | 811           | 912            | 1,156          |
| Air  | 267           | 258            | 321            |
| Land <sup>a</sup>                              | 5             | 4              | 4              |
| Water  | 75            | 135            | 184            |
| Passenger fares                                | 464           | 515            | 647            |
| Tourism and other services                     | 7,069         | 6,382          | 6,771          |
| Tourism  | U             | U              | U              |
| Other services                                 | U             | U              | U              |
| <b>Receipts, total</b>                         | <b>35,989</b> | <b>53,476</b>  | <b>64,662</b>  |
| <b>Payments for imports from Mexico</b>        |               |                |                |
| Merchandise imports, total (customs value)     | 30,157        | 62,101         | 74,297         |
| Trade adjustments, total                       | U             | U              | U              |
| Import merchandise trade (balance of payments) | 30,509        | 62,361         | 75,108         |
| Services, total                                | 8,279         | 10,687         | 11,562         |
| Transportation                                 | 905           | 1,047          | 1,140          |
| Air  | 238           | 294            | 345            |
| Land <sup>a</sup>                              | U             | U              | U              |
| Water  | 102           | 184            | 177            |
| Passenger fares                                | 565           | 569            | 618            |
| Tourism and other services                     | 7,374         | 9,640          | 10,422         |
| Tourism  | U             | U              | U              |
| Other services                                 | U             | U              | U              |
| <b>Payments, total</b>                         | <b>38,788</b> | <b>73,048</b>  | <b>86,670</b>  |
| <b>Balance</b>                                 | <b>-2,799</b> | <b>-19,572</b> | <b>-22,008</b> |

<sup>a</sup>Land refers to trucking, rail and pipeline services, unless otherwise noted.**KEY:** U = Data are unavailable.**NOTE:** Detailed data on North American merchandise trade commodities can be found in Section 6.**SOURCES**U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business*, September 1993, July 1996, and October 1997. (Washington, DC: various years).U.S. Department of Commerce. Bureau of Economic Analysis. *1998 Annual Services Historical Disk*. (Washington, DC: 1998).

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s e c t i o n 3

Transportation  
Safety



**t a b l e 3-1**

## Transportation Fatalities by Mode

|                                 | Canada       |              |              | Mexico        |              |              | United States |               |                           |
|---------------------------------|--------------|--------------|--------------|---------------|--------------|--------------|---------------|---------------|---------------------------|
|                                 | 1990         | 1995         | 1996         | 1990          | 1995         | 1996         | 1990          | 1995          | 1996                      |
| <b>Fatalities, total</b>        | <b>4,184</b> | <b>3,794</b> | <b>3,502</b> | <b>10,234</b> | <b>9,121</b> | <b>9,472</b> | <b>47,248</b> | <b>44,426</b> | <b>44,697</b>             |
| <b>Air</b>                      | <b>99</b>    | <b>117</b>   | <b>75</b>    | <b>24</b>     | <b>30</b>    | <b>86</b>    | <b>864</b>    | <b>963</b>    | <b>1,089</b>              |
| Air carriers                    | 30           | 59           | 28           | 0             | 0            | 0            | 97            | 229           | 457                       |
| General aviation                | 69           | 58           | 47           | 24            | 30           | 86           | 767           | 734           | 632                       |
| <b>Road</b>                     | <b>3,963</b> | <b>3,351</b> | <b>3,091</b> | <b>10,201</b> | <b>9,043</b> | <b>9,305</b> | <b>44,599</b> | <b>41,817</b> | <b><sup>a</sup>42,065</b> |
| 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                     |
| <b>Pipeline</b>                 | <b>0</b>     | <b>0</b>     | <b>0</b>     | <b>U</b>      | <b>U</b>     | <b>U</b>     | <b>9</b>      | <b>21</b>     | <b>53</b>                 |
| <b>Rail</b>                     | <b>103</b>   | <b>120</b>   | <b>119</b>   | <b>9</b>      | <b>48</b>    | <b>81</b>    | <b>1,297</b>  | <b>1,146</b>  | <b>1,039</b>              |
| Grade crossing                  | 48           | 53           | 47           | U             | U            | U            | 698           | 579           | 488                       |
| Railroad                        | 55           | 67           | 72           | U             | U            | U            | 599           | 567           | 551                       |
| <b>Transit, total</b>           | <b>N</b>     | <b>N</b>     | <b>N</b>     | <b>U</b>      | <b>U</b>     | <b>U</b>     | <b>339</b>    | <b>274</b>    | <b>264</b>                |
| Transit rail                    | N            | N            | N            | U             | U            | U            | 228           | 186           | 152                       |
| <b>Water transport</b>          | <b>N</b>     | <b>206</b>   | <b>217</b>   | <b>N</b>      | <b>N</b>     | <b>N</b>     | <b>950</b>    | <b>875</b>    | <b>759</b>                |
| 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                         |

<sup>a</sup>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.

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**t a b l e 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 Policia 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             |
| <b>Injuries, total</b>          | <b>263,196</b> | <b>242,164</b> | <b>231,089</b> | <b>93,417</b> | <b>121,936</b> | <b>115,507</b> | <b>3,292,000</b> | <b>3,516,000</b>             | <b>3,559,000</b> |
| <b>Air</b>                      | <b>72</b>      | <b>66</b>      | <b>45</b>      | <b>52</b>     | <b>52</b>      | <b>30</b>      | <b>478</b>       | <b>459</b>                   | <b>458</b>       |
| Air carriers                    | 15             | 27             | 12             | 0             | 0              | 0              | 76               | 64                           | 99               |
| General aviation                | 57             | 39             | 33             | 52            | 52             | 30             | 402              | 395                          | 359              |
| <b>Road</b>                     | <b>262,680</b> | <b>241,935</b> | <b>230,890</b> | <b>93,325</b> | <b>121,638</b> | <b>115,274</b> | <b>3,231,000</b> | <b><sup>a</sup>3,465,000</b> | <b>3,511,000</b> |
| 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           |
| <b>Pipeline</b>                 | <b>9</b>       | <b>1</b>       | <b>0</b>       | <b>U</b>      | <b>U</b>       | <b>U</b>       | <b>76</b>        | <b>64</b>                    | <b>127</b>       |
| <b>Rail</b>                     | <b>375</b>     | <b>128</b>     | <b>129</b>     | <b>40</b>     | <b>246</b>     | <b>203</b>     | <b>25,143</b>    | <b>14,440</b>                | <b>12,558</b>    |
| 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           |
| <b>Transit, total</b>           | <b>N</b>       | <b>N</b>       | <b>N</b>       | <b>N</b>      | <b>N</b>       | <b>N</b>       | <b>54,556</b>    | <b>57,196</b>                | <b>55,288</b>    |
| Transit rail                    | N              | N              | N              | N             | N              | N              | 13,718           | 14,931                       | 14,650           |
| <b>Water transport</b>          | <b>N</b>       | <b>N</b>       | <b>N</b>       | <b>N</b>      | <b>N</b>       | <b>N</b>       | <b>3,997</b>     | <b>4,286</b>                 | <b>4,571</b>     |
| 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                |

<sup>a</sup>Total different from the sum of components because of independent rounding.

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

**t a b l e** 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 Policia 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).

**t a b l e 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       | <sup>e</sup> 317.1 | N                 | N      | N       | N       | 3,450         | 3,899     | 3,995     |
| Road motor vehicles, total (millions)       | 17.0    | <sup>r</sup> 17.0  | <sup>r</sup> 17.2 | 10.2   | 12.0    | 12.4    | 193.1         | 205.4     | 210.2     |
| <b>Rates per 100 million vehicle-km</b>     |         |                    |                   |        |         |         |               |           |           |
| Fatality                                    | N       | <sup>e</sup> 1.1   | N                 | N      | N       | N       | 1.3           | 1.1       | 1.1       |
| Injury                                      | N       | 76                 | N                 | N      | N       | N       | 94            | 89        | 88        |
| <b>Rates per 10,000 road motor vehicles</b> |         |                    |                   |        |         |         |               |           |           |
| 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).

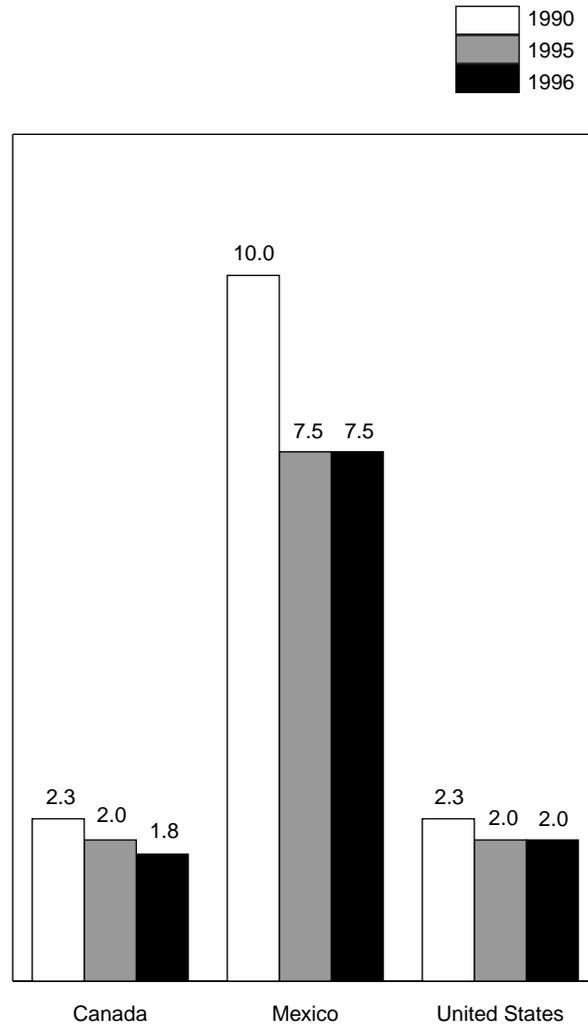
Secretaría de Comunicaciones y Transportes. Dirección General de Policía Federal de Caminos y Puertos. (Mexico City, D.F.: various years).

#### 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).

**f i g u r e** 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<br>1996<br>(cumulative) | 1990 through<br>1996<br>(annual<br>averages) | 1993 through<br>1996<br>(cumulative) | 1993 through<br>1996<br>(annual<br>averages) | 1990 through<br>1996<br>(cumulative) | 1990 through<br>1996<br>(annual<br>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  |
| <b>Rates per 100,000 flight segments</b> |                                      |  |                                      |  |                                      |  |
| 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 occurring 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.

**t a b l e** 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).

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s e c t i o n 4

Transportation,  
Energy and the  
Environment



**t a b l e** 4-1

## Energy Consumption by the Transportation Sector

(Exajoules, 10 to the 18 joules)

|  | Canada |        |        | Mexico |       |       | United States |        |        |
|--|--------|--------|--------|--------|-------|-------|---------------|--------|--------|
|  | 1990   | 1995   | 1996   | 1990   | 1995  | 1996  | 1990          | 1995   | 1996   |
| Energy consumption, total <sup>a</sup>                       | 7.84   | 8.59   | 8.98   | 5.16   | 5.49  | 5.90  | 88.75         | 95.86  | 99.04  |
| Transportation consumption, total <sup>b</sup>               | 2.04   | 2.27   | 2.33   | 1.28   | 1.40  | 1.44  | 23.78         | 25.40  | 26.02  |
| Transportation's share of total energy consumption (percent) | 26.0   | 26.4   | 25.9   | 24.8   | 25.5  | 24.4  | 26.8          | 26.5   | 26.3   |
| Fossil fuels, total exajoules <sup>c</sup>                   | 2.03   | 2.26   | 2.31   | N      | N     | N     | 23.73         | 25.35  | 25.98  |
| Natural gas (exajoules)                                      | 0.14   | 0.24   | 0.25   | N      | N     | N     | 0.72          | 0.76   | 0.77   |
| Trillion cubic meters  | 0.0035 | 0.0063 | 0.0065 | N      | N     | N     | 0.0187        | 0.0198 | 0.0201 |
| Petroleum (exajoules)  | 1.89   | 2.01   | 2.06   | 1.27   | 1.40  | 1.43  | 23.01         | 24.59  | 25.20  |
| Million barrels  | 329    | 351    | 359    | 211    | 243   | 249   | 4,004         | 4,281  | 4,385  |
| Electricity <sup>b</sup>                                     | 0.012  | 0.014  | 0.014  | 0.003  | 0.003 | 0.004 | 0.015         | 0.014  | 0.014  |

<sup>a</sup>For all three countries, energy consumption, total **includes** electrical system energy losses.

<sup>b</sup>For all three countries, transportation consumption, total and electricity do **not** include electrical system energy losses.

<sup>c</sup>Coal is not included in this table, because all three countries use negligible amounts of coal for transportation.

**KEY:** N = Data are nonexistent.

### NOTES

#### Canada

Energy consumption, total: Includes renewable energy.

Transportation consumption, total: Includes fuel used in fisheries and in private trucking but excludes fuel consumption by public administrations.

#### Mexico

Natural gas: Data are nonexistent, but natural gas consumption in Mexico is estimated to be quite small.

#### United States

Energy consumption, total: Includes renewable energy.

Transportation consumption, total: Total is greater than the sum of the components, because electrical system energy losses are not listed. Fisheries are not included, but fuel consumption by public administrations is included.

### SOURCES

#### Canada

Statistics Canada. *Quarterly Report on Energy Supply-Demand in Canada, Catalogue No. 57-003-XPB*. (Ottawa, Ont.: various editions).

#### Mexico

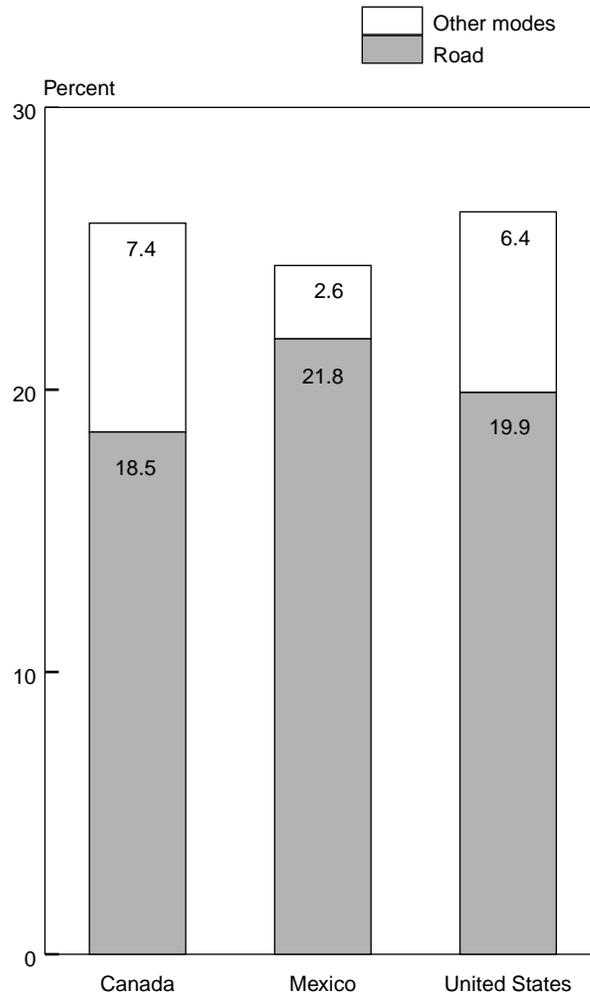
Secretaría de Energía. *Balance Nacional, Energía. 1996*. (Mexico City, D.F.: 1998).

#### United States

U.S. Department of Energy. Energy Information Agency. *Annual Energy Review, 1997 and Monthly Energy Review, August 1998*. (Washington, DC: 1998).

**f i g u r e** 4-1

# Transportation's Percent Share of Total Energy Consumption: 1996



Total energy consumption, Mexico: Pipeline energy consumption is not included in Mexico's transportation energy consumption figures. If pipeline data were included, the share of other modes would be greater and transportation's share of total energy consumption would also be more.  
Notes and sources: See Tables 4-1 and 4-2.

**t a b l e** 4-2

# Energy Consumption by Mode of Transportation

(Petajoules, 10 to the 15th joules)

|                            | Canada         |                |                | Mexico         |                |                | United States |               |               |
|----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|---------------|---------------|
|                            | 1990           | 1995           | 1996           | 1990           | 1995           | 1996           | 1990          | 1995          | 1996          |
| <b>Total</b>               | <b>2,037.7</b> | <b>2,269.1</b> | <b>2,325.1</b> | <b>1,275.3</b> | <b>1,399.1</b> | <b>1,435.2</b> | <b>23,780</b> | <b>25,400</b> | <b>26,020</b> |
| <b>Air</b>                 | <b>185.2</b>   | <b>185.1</b>   | <b>205.8</b>   | <b>73.6</b>    | <b>95.4</b>    | <b>93.4</b>    | <b>1,910</b>  | <b>1,937</b>  | <b>1,995</b>  |
| Jet fuel                   | 179.7          | 181.0          | 201.9          | 71.9           | 91.5           | 92.2           | 1,865         | 1,902         | 1,959         |
| Aviation gasoline          | 5.5            | 4.1            | 3.9            | 1.7            | 3.9            | 1.2            | 45            | 35            | 36            |
| <b>Road</b>                | <b>1,494.4</b> | <b>1,631.3</b> | <b>1,661.0</b> | <b>1,147.0</b> | <b>1,253.5</b> | <b>1,289.1</b> | <b>N</b>      | <b>19,278</b> | <b>19,752</b> |
| Gasoline                   | 1,176.0        | 1,213.7        | 1,229.4        | 837.9          | 928.9          | 944.4          | 14,445        | 15,438        | 15,762        |
| Diesel                     | 292.5          | 384.5          | 397.5          | 293.9          | 306.0          | 325.5          | 3,100         | 3,800         | 3,950         |
| Other fuels                | 25.9           | 33.1           | 34.1           | 15.2           | 18.6           | 19.2           | N             | 40            | 40            |
| <b>Pipeline</b>            | <b>142.4</b>   | <b>245.3</b>   | <b>254.5</b>   | <b>U</b>       | <b>U</b>       | <b>U</b>       | <b>718</b>    | <b>762</b>    | <b>774</b>    |
| Natural gas                | 133.1          | 232.9          | 241.5          | U              | U              | U              | 718           | 762           | 774           |
| Electricity                | 8.7            | 11.0           | 10.8           | U              | U              | U              | U             | U             | U             |
| Diesel                     | 0.6            | 1.4            | 2.2            | U              | U              | U              | U             | U             | U             |
| <b>Rail</b>                | <b>89.5</b>    | <b>80.9</b>    | <b>79.1</b>    | <b>26.6</b>    | <b>22.6</b>    | <b>24.7</b>    | <b>469</b>    | <b>520</b>    | <b>536</b>    |
| Distillate/diesel fuel     | 89.5           | 80.9           | 79.1           | 26.6           | 22.6           | 24.7           | 468           | 519           | 535           |
| Freight rail               | 87.2           | 78.8           | 77.0           | U              | U              | U              | 456           | 509           | 524           |
| Intercity passenger        | 2.3            | 2.1            | 2.1            | U              | U              | U              | 12            | 10            | 11            |
| Electricity                |                |                |                | U              | U              | U              |               |               |               |
| Intercity passenger        | NS             | NS             | NS             | U              | U              | U              | 1             | 1             | 1             |
| <b>Transit</b>             | <b>19.0</b>    | <b>24.6</b>    | <b>23.5</b>    | <b>N</b>       | <b>N</b>       | <b>N</b>       | <b>N</b>      | <b>125</b>    | <b>123</b>    |
| Electricity                | 3.1            | 3.0            | 3.0            | 2.7            | 3.5            | 3.6            | 17            | 18            | 18            |
| Motor fuels                |                |                |                |                |                |                |               |               |               |
| Gasoline                   | 0.5            | 0.4            | NS             | N              | N              | N              | 4             | 6             | 6             |
| Diesel                     | 12.8           | 13.4           | 12.7           | N              | N              | N              | 95            | 99            | 97            |
| Compressed natural gas     | 2.6            | 7.8            | 7.8            | N              | N              | N              | N             | 2             | 2             |
| <b>Water transport</b>     | <b>107.3</b>   | <b>102.0</b>   | <b>101.3</b>   | <b>N</b>       | <b>N</b>       | <b>N</b>       | <b>1,472</b>  | <b>1,412</b>  | <b>1,396</b>  |
| Residual fuel oil          | 60.1           | 55.7           | 55.3           | 20.7           | 1.4            | 1.6            | 999           | 930           | 900           |
| Distillate/diesel fuel oil | 47.2           | 45.5           | 45.4           | 4.7            | 22.7           | 22.9           | 302           | 342           | 365           |
| Gasoline                   | NS             | 0.8            | 0.6            | N              | N              | N              | 171           | 140           | 131           |

**KEY:** N = Data are nonexistent. NS = Not significant. U = Data are unavailable.

**NOTES**

**All Countries**

Transportation energy consumption: Electrical systems energy losses are excluded from the overall total as well as individual modal totals.

Transit: Canadian and U.S. data refer to **all transit**, including local transit buses and other road transit vehicles, which are also reported under road. Some ferryboats are also included.

**Mexico**

Road, other fuels: Refers to liquified petroleum gas.

Road, gasoline, diesel, other fuels: Includes data on transit, motor fuels, and no breakdown is possible.

Rail, distillate/diesel fuel: Includes passenger and cargo services, and no breakdown is possible.

Transit, motor fuels: Data for subcategories cannot be separately identified for transit. Instead they are included in the fuel categories for road (gasoline, diesel and other fuels).

Water transport, residual fuel oil, distillate/diesel fuel oil: In 1991, vessel fuel usage began to change. Diesel began to be substituted for residual fuel oil.

**United States**

Total: The total differs from the sum of the individual modes for reasons discussed in Appendix B.

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**t a b l e 4-2****Energy Consumption by Mode of Transportation—Continued****SOURCES****Canada**

All modes except transit rail: Statistics Canada. *Quarterly Report on Energy Supply-Demand in Canada, Catalogue No. 57-003-XPB*. (Ottawa, Ont.: various quarterly editions).

Natural Resources Canada. *Canada's Energy Outlook 1996-2020*. (Ottawa, Ont.: 1998).

Transit rail: Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue No. 53-215-XPB*. (Ottawa, Ont.: various years).

**Mexico**

Secretaría de Energía. *Balance Nacional, Energía. 1996*. (Mexico City, D.F.: 1998).

Comisión Nacional para el Ahorro de Energía. Private communication. (Mexico City, D.F.: 1998).

**United States**

Total: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review, 1997*. (Washington, DC: 1998).

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. Private Communication. (Washington, DC: 1998).

U.S. Department of Transportation. Federal Aviation Administration. *General Aviation and Avionics Survey*. (Washington, DC: various years).

Road: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997).

U.S. Department of Energy. Energy Information Administration. *Alternatives to Traditional Transportation Fuels, 1996*. (Washington, DC: 1997).

Pipeline: U.S. Department of Energy. *Natural Gas Annual 1996*. (Washington, DC: 1997).

Rail: Association of American Railroads. *Railroad Facts, 1997 Edition*. (Washington, DC: 1997).

National Railroad Passenger Corp. State and Local Affairs Department. Private Communication. (Washington, DC: 1998).

National Railroad Passenger Corp. Director of Fuel Management. Private Communication. (Washington, DC: 1998).

American Public Transit Association. *Transit Fact Book*. (Washington, DC: various years).

American Public Transit Association. Private Communication. (Washington, DC: 1998).

Water transport: U.S. Department of Energy. Energy Information Administration. *Fuel Oil and Kerosene Sales*. (Washington, DC: various years).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997).

**t a b l e** 4-3

## Estimated Consumption of Alternative and Replacement Fuels for Road Motor Vehicles

(Thousand gasoline-equivalent liters)

|                                    | Canada            |                   |                   | Mexico   |          |          | United States      |                    |                    |
|------------------------------------|-------------------|-------------------|-------------------|----------|----------|----------|--------------------|--------------------|--------------------|
|                                    | 1990              | 1995              | 1996              | 1990     | 1995     | 1996     | 1992 <sup>a</sup>  | 1995               | 1996               |
| <b>Fuel consumption, total</b>     | <b>42,324,176</b> | <b>46,177,399</b> | <b>46,997,886</b> | <b>N</b> | <b>N</b> | <b>N</b> | <b>508,118,000</b> | <b>548,035,000</b> | <b>560,929,000</b> |
| <b>Alternative fuels, total</b>    | <b>824,370</b>    | <b>1,179,468</b>  | <b>1,210,743</b>  | <b>N</b> | <b>N</b> | <b>N</b> | <b>869,248</b>     | <b>1,050,478</b>   | <b>1,125,142</b>   |
| Liquefied petroleum gases (LPG)    | 748,240           | 954,847           | 985,256           | N        | N        | N        | 787,903            | 880,869            | 905,312            |
| Compressed natural gas (CNG)       | 76,110            | 224,321           | 225,187           | N        | N        | N        | 63,682             | 133,103            | 177,623            |
| Liquefied natural gas (LNG)        | 0                 | 0                 | 0                 | N        | N        | N        | 2,214              | 10,444             | 12,291             |
| Methanol, 85 percent (M85)         | 20                | 300               | 300               | N        | N        | N        | 4,047              | 10,928             | 12,833             |
| Methanol, neat (M100)              | 0                 | 0                 | 0                 | N        | N        | N        | 9,641              | 8,139              | 1,314              |
| Ethanol, 85 percent (E85)          | 0                 | 0                 | 0                 | N        | N        | N        | 79                 | 719                | 2,627              |
| Ethanol, 95 percent (E95)          | 0                 | 0                 | 0                 | N        | N        | N        | 322                | 3,766              | 10,217             |
| <b>Electricity</b>                 | <b>NS</b>         | <b>NS</b>         | <b>NS</b>         | <b>N</b> | <b>N</b> | <b>N</b> | <b>1,359</b>       | <b>2,510</b>       | <b>2,926</b>       |
| Oxygenates                         |                   |                   |                   |          |          |          |                    |                    |                    |
| Methyl tertiary butyl ether (MTBE) | NS                | NS                | NS                | N        | N        | N        | 4,448,000          | 10,187,300         | 10,408,700         |
| Ethanol in gasohol                 | 10,000            | 40,000            | 40,000            | N        | N        | N        | 2,654,000          | 3,447,400          | 2,499,100          |
| <b>Traditional fuels</b>           |                   |                   |                   |          |          |          |                    |                    |                    |
| Gasoline                           | 33,928,534        | 35,017,600        | 35,471,523        | N        | N        | N        | 416,906,000        | 438,892,000        | 445,857,000        |
| Diesel                             | 7,561,272         | 9,940,331         | 10,275,620        | N        | N        | N        | 90,343,000         | 108,092,590        | 113,946,310        |

<sup>a</sup>U.S. data for 1990 are not available. Nearest data year is 1992.

**KEY:** N = Data are nonexistent. NS = Not significant.

### NOTE

#### Mexico

Alternative fuels, liquefied petroleum gases: In Table 4-2 under road, other fuels, an estimation of fuel consumption in petajoules is shown.

### SOURCES

#### Canada

Natural Resources Canada. Office of Energy Efficiency. (Ottawa, Ont.: 1998).

#### United States

U.S. Department of Energy. Energy Information Administration. *Alternatives to Traditional Transportation Fuels, 1996*. (Washington, DC: 1997).

**t a b l e** 4-4

## Average Price<sup>a</sup> of Fossil Fuel to End-Users

(Current U.S. cents per liter)

|                           | Canada |      |      | Mexico |      |      | United States |      |      |
|---------------------------|--------|------|------|--------|------|------|---------------|------|------|
|                           | 1990   | 1995 | 1996 | 1990   | 1995 | 1996 | 1990          | 1995 | 1996 |
| <b>Motor vehicle fuel</b> |        |      |      |        |      |      |               |      |      |
| <b>Gasoline</b>           |        |      |      |        |      |      |               |      |      |
| Leaded                    | NA     | NA   | NA   | 25.2   | 33.6 | 36.8 | 30.4          | NA   | NA   |
| Unleaded premium          | 54.0   | 47.2 | 49.4 | NA     | NA   | 41.8 | 35.6          | 35.3 | 37.3 |
| Unleaded regular          | 50.1   | 40.4 | 42.5 | 35.6   | 34.9 | 37.9 | 30.7          | 30.3 | 32.5 |
| Average over all types    |        |      |      |        |      |      |               |      |      |
| Price with taxes          | U      | U    | U    | U      | U    | U    | 32.1          | 31.8 | 34.0 |
| Taxes                     | 19.6   | 19.5 | 19.9 | U      | U    | U    | 6.5           | 9.7  | 9.8  |
| <b>Diesel</b>             |        |      |      |        |      |      |               |      |      |
| Price with taxes          | 43.1   | 30.7 | 31.7 | 21.5   | 25.5 | 28.2 | U             | 29.3 | 32.6 |
| Taxes                     | 15.3   | 12.2 | 12.3 | U      | U    | U    | 8.2           | 11.5 | 11.4 |
| <b>Aviation fuel</b>      |        |      |      |        |      |      |               |      |      |
| Gasoline                  | 42.1   | 31.3 | 31.6 | 35.6   | 34.9 | 37.9 | 29.6          | 26.5 | 29.5 |
| Jet fuel                  | 22.1   | 14.1 | 15.4 | 25.2   | 17.8 | 23.4 | 20.3          | 14.4 | 17.1 |
| <b>Rail fuel</b>          |        |      |      |        |      |      |               |      |      |
| Diesel                    | 23.5   | 15.7 | 17.1 | 21.5   | 25.5 | 28.2 | 18.3          | 15.9 | 17.9 |
| <b>Water transport</b>    |        |      |      |        |      |      |               |      |      |
| Combined fuels            | 14.4   | 10.1 | 11.6 | 8.1    | 6.5  | 13.2 | U             | 10.1 | 11.0 |

<sup>a</sup>Unless otherwise stated in the country notes below, prices include the cost of the fuel and taxes. Taxes are given separately in this table only for all types of motor vehicle gasoline and for motor vehicle diesel fuel. See Appendix B for information on fuel taxes in each country.

**KEY:** NA = Not applicable. U = Data are unavailable.

### NOTES

#### Mexico

Data refer to sales price to the public as of December 31 of each year.

#### United States

Motor vehicle fuel taxes: Sales weighted average of Federal and state fuel taxes only. Does not include state sales taxes. If these were included, they would raise the average tax in 1996 by roughly half a cent per liter for both gasoline and diesel. Note that the motor vehicle fuel prices do include state sales taxes.

Aviation fuel: Does not include any taxes. Price of jet fuel is that paid by the large certified air carriers, which are defined in Appendix B.

Rail fuel: Price includes federal fuel taxes only, no state taxes are included.

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**t a b l e 4-4****Average Price<sup>a</sup> of Fossil Fuel to End-Users—Continued****SOURCES****Canada**

Natural Resources Canada. Office of Energy Efficiency. (Ottawa, Ont.: 1998).

**Mexico**

Petróleos Mexicanos. *Anuario Estadístico, 1998*. (Mexico City, D.F.: 1999).

Petróleos Mexicanos. PEMEX-Refinación. Subgerencia de Planeación (Mexico City, D.F.: 1999)

**United States**

Motor vehicle fuel: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review 1997*. (Washington, DC: 1998).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997).

Aviation fuel, gasoline: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review, 1997*. (Washington, DC: 1998).

Aviation fuel, jet fuel: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. Private Communication. (Washington, DC: 1998).

Rail fuel: Association of American Railroads. *Railroad Facts, 1997 Edition*. (Washington, DC: 1997).

Rail fuel taxes: Association of American Railroads. Private Communication. (Washington, DC: 1998).

Water transport: U.S. Department of Transportation. Maritime Administration (MARAD). Private Communication. (Washington, DC: 1998).

table 4-5

## New Model Year Fuel Efficiency for Road Motor Vehicles

(Liters per 100 kilometers)

|                               | Canada      |             |             | Mexico |             |               | United States |             |             |
|-------------------------------|-------------|-------------|-------------|--------|-------------|---------------|---------------|-------------|-------------|
|                               | 1990        | 1995        | 1996        | 1990   | 1995        | 1996          | 1990          | 1995        | 1996        |
| <b>Sales weighted average</b> |             |             |             |        |             |               |               |             |             |
| Passenger cars                | 8.2         | 7.9         | 7.9         | 9.1    | 8.0         | 7.8           | 8.4           | 8.2         | 8.2         |
| Light trucks                  | 11.4        | 11.5        | 11.3        | U      | U           | U             | 11.3          | 11.5        | 11.4        |
| <b>Range</b>                  |             |             |             |        |             |               |               |             |             |
| Passenger cars                | 20.8 to 5.0 | 19.4 to 4.9 | 17.9 to 4.9 | U      | 9.28 to 6.9 | 10.77 to 6.34 | 27.0 to 3.6   | 22.8 to 4.0 | 17.0 to 4.3 |
| Light trucks                  | 22.4 to 6.8 | 18.8 to 8.5 | 18.1 to 8.5 | U      | U           | U             | 19.8 to 7.0   | 16.0 to 7.0 | 16.8 to 7.5 |

**KEY:** U = Data are unavailable.

### NOTES

#### All Countries

Sales weighted average: Assumes 55 percent city and 45 percent highway travel.

Light trucks: Gross vehicle weight rating of zero kg to 3,856 kg (i.e., 8,500 pounds or less).

Averages and ranges: United States and Canada include both domestic and imported vehicles. Mexico includes only domestic vehicles.

### SOURCES

#### Canada

Sales weighted average: Transport Canada. *Transportation in Canada, 1997—Annual Report, TP 13198*. (Ottawa, Ont.: 1998).

Ranges: Natural resources Canada. *Canada's Energy Outlook, 1996-2020*. (Ottawa, Ont.: 1997).

Transport Canada and Natural Resources Canada. *Fuel Consumption Guide, Annual*. (Ottawa, Ont.: various years).

#### Mexico

Secretaría de Energía. Comisión Nacional para el Ahorro de Energía, Dirección de Transporte. (Mexico City, D.F.: 1998).

#### United States

Sales weighted average: U.S. Department of Transportation. National Highway Traffic Safety Administration. Consumer Programs Division, NPS-32. (Washington, DC: 1998).

Ranges: U.S. Department of Transportation. National Highway Traffic Safety Administration. Automotive Fuel Economy Program. *Twenty-Second Annual Report to Congress*. (Washington, DC: various years).

U.S. Department of Transportation. National Highway Traffic Safety Administration. Consumer Programs Division, NPS-32. Private Communication. (Washington, DC: 1998).

**t a b l e** 4-6a

# Federal Emission Control Requirements for Passenger Cars and Light Trucks: Model Year

(Grams of emissions per kilometer)

|  | Total hydrocarbons | Nonmethane hydrocarbons | Carbon monoxide (CO) | Cold temperature CO | Nitrogen oxides | Particulates      |
|--|--------------------|-------------------------|----------------------|---------------------|-----------------|-------------------|
| <b>Canada, 1996</b>                              |                    |                         |                      |                     |                 |                   |
| Passenger cars                                   | 0.25               | NA                      | 2.1                  | NA                  | 0.62            | <sup>a</sup> 0.12 |
| Light trucks                                     |                    |                         |                      |                     |                 |                   |
| Under 1,701 kg, (loaded vehicle weight)          | 0.50               | NA                      | 6.2                  | NA                  | 0.75            | <sup>a</sup> 0.16 |
| Over 1,700 kg, (loaded vehicle weight)           | 0.50               | NA                      | 6.2                  | NA                  | 1.1             | <sup>a</sup> 0.08 |
| <b>Mexico, model years 1995 and later</b>        |                    |                         |                      |                     |                 |                   |
| Passenger cars                                   | 0.25               | NA                      | 2.11                 | NA                  | 0.62            | NA                |
| Light trucks                                     | 0.63               | NA                      | 8.75                 | NA                  | 1.44            | NA                |
| Under 3,857 kg, (gross vehicle weight)           |                    |                         |                      |                     |                 |                   |
| <b>United States, model years 1994 and later</b> |                    |                         |                      |                     |                 |                   |
| Passenger cars                                   |                    |                         |                      |                     |                 |                   |
| Intermediate useful life                         | 0.25               | 0.16                    | 2.1                  | 6.2                 | 0.25            | 0.05              |
| Full useful life                                 | NA                 | 0.19                    | 2.6                  | NA                  | 0.4             | 0.06              |
| Light trucks                                     |                    |                         |                      |                     |                 |                   |
| 1,701 to 2,608 kg, (loaded vehicle weight)       |                    |                         |                      |                     |                 |                   |
| Intermediate useful life                         | NA                 | 0.20                    | 2.7                  | 6.2                 | 0.4             | <sup>b</sup> 0.05 |
| Full useful life                                 | 0.50               | 0.25                    | 3.4                  | NA                  | 0.60            | <sup>b</sup> 0.06 |

<sup>a</sup>Applies to diesel-fueled vehicles only.

<sup>b</sup>Phase-in begins with model-year 1995.

**KEY:** NA = Not applicable.

**NOTES**

**All Countries**

Light trucks are vehicles of about 3,856 kg or less gross vehicle weight rating (GVWR). For United States and Canada, the **exact** definition is 8,500 pounds or less, and, for the time period of this table, there are four and two categories of light trucks, respectively, within the range of zero through 8,500 pounds.

**Canada**

Loaded vehicle weight (LVW): See Appendix B under the United States for definition.

From September 1, 1997, Canadian standards are harmonized with U.S. standards by regulation, for all classes of on-road vehicles.

Passenger cars and light trucks: For cars (light-duty vehicles) and light trucks (light-duty trucks, LDT), Canadian 1996 regulated standards were technically equivalent to those of the United States for 1988 model year vehicles, but in practice, manufacturers and importers provided vehicles meeting U.S. 1996 standards.

**Mexico**

Particulates: No regulations are in effect for particulates for these vehicles.

**United States**

Useful life: The life over which the standards must be met. See Appendix B for a more complete definition.

Measurement units: The U.S. regulations are written in units of grams per mile. This table has converted the U.S. regulations to grams per kilometer. A simple conversion back to U.S. measures will result in rounding error and/or an incorrect level of precision in some cases. Appendix D provides the original U.S. measures.

Coverage: This table is a **simplification** of the U.S. emissions standards for passenger cars and light trucks.

Implementation schedules: Schedules are summarized in Appendix B. The standards were phased in over several years.

Passenger cars and light trucks: Data are for **gasoline-fueled vehicles only**. See Appendix B for the differences for diesel fueled vehicles.

Light trucks: There are four categories of light trucks. The regulations presented here are for the LDT2 category, which has a GVWR up to 2,722 kg (ie., 6,000 pounds or less) and a LVW of 1701 kg to 2,608 kg (ie., 3,751 pounds through 5,750 pounds). (GVWR and LVR are defined in Appendix B.) In 1996, LDT2s accounted for more than 60 percent of the sales of new light trucks.

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**t a b l e** 4-6a

**Federal Emission Control Requirements for Passenger  
Cars and Light Trucks: Model Year—Continued**

**SOURCES**

**Canada**

Transport Canada. Road Safety and Motor Vehicle Regulations Directorate. (Ottawa, Ont.: 1998).

**Mexico**

Instituto Nacional de Ecología. Diario Oficial de la Federación. *Norma Oficial Mexicana NOM-042-ECOL-1993*. (Mexico City, D.F.: 1993).

**United States**

*U.S. Code of Federal Regulations*. (Washington, DC: 1998).

U.S. Environmental Protection Agency. Office of Air and Radiation. *Mobile Source Emissions Standards Summary*. (Washington, DC: 1992).

U.S. Environmental Protection Agency. Office of Air and Radiation. Office of Mobile Sources, Vehicle Programs and Compliance Division. *Tier 2 Study White Paper*. (Washington, DC: 1997).

**t a b l e** 4-6b

# Federal Emission Control Requirements for Heavy Trucks: Model Year

(Grams of emissions per brake horsepower-hour)

|  | Total hydrocarbons | Carbon monoxide (CO) | Nitrogen oxides | Particulates | Smoke (percentage) |
|--|--------------------|----------------------|-----------------|--------------|--------------------|
| <b>Mexico</b>  |                    |                      |                 |              |                    |
| Compression ignition, model years 1994-1997<br>(weight more than 3,857 kg)                               | 1.3                | 15.5                 | 5.0             | 0.7 or 0.10  | 20/15/50           |
| Spark ignition, model years 1995-1997  |                    |                      |                 |              |                    |
| Weight between 3,858 and 6,350 kg  | 1.1                | 14.4                 | 5.0             | NA           | NA                 |
| Weight greater than 6,350 kg   | 1.9                | 37.1                 | 5.0             | NA           | NA                 |
| <b>United States and Canada, model years 1994 and later</b>  |                    |                      |                 |              |                    |
| Compression ignition, model years 1994-1997<br>(weight more than 3,856 kg; i.e., more than 8,500 pounds) | 1.3                | 15.5                 | 5.0             | 0.10         | 20/15/50           |
| Spark ignition, model years 1991-1997  |                    |                      |                 |              |                    |
| Weight between 3,856 and 6,350 kg  | 1.1                | 14.4                 | 5.0             | NA           | NA                 |
| Weight greater than 6,350 kg   | 1.9                | 37.1                 | 5.0             | NA           | NA                 |

**KEY:** NA = Not applicable.

**NOTES**

**All Countries**

Compression ignition, smoke: Percentages apply to smoke opacity at acceleration/lug/peak modes.

**Canada**

From September 1, 1997, Canadian standards are harmonized with U.S. standards by regulation, for all classes of on-road vehicles.

Heavy trucks: For heavy trucks (heavy-duty vehicles), Canadian vehicles were provided to U.S. standards by a Memorandum of Understanding with the industry.

**Mexico**

Compression ignition, particulates: The limit is 0.10 for vehicles under 14,969 kg and 0.7 for vehicles over 14,969 kg.

**United States**

Compression ignition: Standards apply to both diesel and methanol-fueled engines.

Spark ignition: Standards apply to gasoline, methanol and liquified petroleum gas-fueled engines (LPG).

Spark ignition, weights: The first category of spark ignition heavy trucks in this table weighs more than 8,500 pounds and weighs 14,000 pounds or less. The second category weighs more than 14,000 pounds.

**SOURCES**

**Canada**

Transport Canada. Road Safety and Motor Vehicle Regulations Directorate. (Ottawa, Ont.: 1998).

**Mexico**

Instituto Nacional de Ecología. *Diario Oficial de la Federación. Norma Oficial Mexicana NOM-044-ECOL-1993.* (Mexico City, D.F.: 1993).

Secretaría de Medio Ambiente, Recursos Naturales y Pesca. *Diario Oficial de la Federación. Norma Oficial Mexicana NOM-076-ECOL-1995.* (Mexico City, D.F.: 1995).

**United States**

U.S. Environmental Protection Agency. Office of Air and Radiation. *Emission Standards Reference Guide for Heavy-Duty and Nonroad Engines (EPA420-F-97-014).* (Washington, DC: 1997).

U.S. Environmental Protection Agency. Office of Air and Radiation. *Mobile Source Emissions Standards Summary.* (Washington, DC: 1992).



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s e c t i o n 5

Domestic Freight  
Activity



**t a b l e** 5-1

## Domestic Freight Activity by Mode

(Millions of metric tons)

|                                  | Canada       |              |              | Mexico       |              |              | United States  |                |                |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|----------------|----------------|
|                                  | 1990         | 1995         | 1996         | 1990         | 1995         | 1996         | 1990           | 1995           | 1996           |
| <b>Total</b>                     | <b>623.3</b> | <b>711.8</b> | <b>734.6</b> | <b>380.1</b> | <b>429.3</b> | <b>445.2</b> | <b>6,079.3</b> | <b>7,062.0</b> | <b>7,320.7</b> |
| <b>Air</b>                       | <b>0.4</b>   | <b>0.4</b>   | <b>0.4</b>   | <b>0.1</b>   | <b>0.1</b>   | <b>0.1</b>   | <b>7.7</b>     | <b>8.5</b>     | <b>9.8</b>     |
| <b>Water transport</b>           | <b>60.4</b>  | <b>50.5</b>  | <b>48.8</b>  | <b>30.6</b>  | <b>31.8</b>  | <b>31.6</b>  | <b>1,014.0</b> | <b>985.4</b>   | <b>991.9</b>   |
| Coastal shipping                 | 26.2         | 22.6         | 21.1         | 30.6         | 31.8         | 31.6         | 270.9          | 241.9          | 242.6          |
| Great Lakes                      | 10.6         | 7.7          | 8.8          | NA           | NA           | NA           | 99.9           | 105.3          | 104.2          |
| Inland waterways <sup>a</sup>    | 23.6         | 20.2         | 18.9         | NA           | NA           | NA           | 643.2          | 638.1          | 645.1          |
| <b>Pipeline</b>                  | <b>221.4</b> | <b>290.6</b> | <b>303.5</b> | <b>U</b>     | <b>U</b>     | <b>U</b>     | <b>1,416.2</b> | <b>1,551.6</b> | <b>1,611.8</b> |
| Crude oil and petroleum products | 145.8        | 174.5        | 183.4        | U            | U            | U            | 958.9          | 1,017.0        | 1,067.8        |
| Natural gas                      | 75.6         | 116.1        | 120.1        | U            | U            | U            | 457.3          | 534.6          | 544.0          |
| <b>Rail</b>                      | <b>191.8</b> | <b>203.0</b> | <b>200.0</b> | <b>34.7</b>  | <b>30.7</b>  | <b>30.2</b>  | <b>1,292.6</b> | <b>1,405.8</b> | <b>1,461.4</b> |
| <b>Road</b>                      | <b>149.3</b> | <b>167.3</b> | <b>181.9</b> | <b>314.7</b> | <b>366.7</b> | <b>383.3</b> | <b>2,348.7</b> | <b>3,110.7</b> | <b>3,245.9</b> |

<sup>a</sup>Commercially navigable.

**KEY:** NA = Not applicable. U = Data are unavailable.

**NOTES**
**Canada**

 Road: Includes *only* activity of Canadian domiciled for-hire carriers with annual intercity revenues greater than or equal to 1 million Canadian dollars; excludes local (less than 24 kilometers) deliveries and deliveries made by private trucks and small for-hire carriers.

Pipeline: Data are for both oil pipelines and natural gas.

**Mexico**

Total: Does not include data for pipelines because the data are unavailable.

Road: Includes only intercity truck activity on the Mexican federal highway system.

**United States**

 Road: Data are for *intercity* for-hire and private truck only.

Pipeline: Data are for both oil pipelines and natural gas.

**SOURCES**
**Canada**

 Air: Statistics Canada. *Canadian Civil Aviation, Catalogue No. 51-206-XPB*. (Ottawa, Ont.: various years).

Coastal shipping, Great Lakes and inland waterways and rail: Transport Canada. Economic Analysis Directorate based on Statistics Canada data. (Ottawa, Ont.: 1998).

 Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue No. 55-201-XPB*, and *Gas Utilities Transport and Distribution Systems, Catalogue No. 57-205-XPB*. (Ottawa, Ont.: various years).

Rail: Transport Canada. Economic Analysis Directorate, based on Statistics Canada data. (Ottawa, Ont.: 1998).

 Road: Statistics Canada. *Trucking in Canada, Catalogue No. 53-222-XPB*. (Ottawa, Ont.: various years).

**Mexico**

 Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras 1990-1996*. (Mexico City, D.F.: 1998).

 Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

 Rail: Secretaría de Comunicaciones y Transportes. Based on data from Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1998).

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**t a b l e 5-1****Domestic Freight Activity by Mode—Continued****United States**

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: various years).

Coastal shipping, Great Lakes and inland waterways: U.S. Army Corps of Engineers. *Waterborne Commerce of the U.S., Part 5*. (New Orleans, LA: Annual issues).

Pipeline, crude oil and petroleum products: Association of Oil Pipe Lines. *Shifts in Petroleum Transportation*. (Washington, DC: various years).

Pipeline, natural gas: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation based on Department of Energy data. (Washington, DC: 1999).

Rail: Association of American Railroads. *Railroad Facts, 1997*. (Washington, DC: 1997).

Road: Eno Transportation Foundation, Inc. *Transportation in America, 1997*. (Lansdowne, VA: 1997).

**t a b l e** 5-2

## Domestic Freight Activity by Mode

(Billions (thousand millions) of metric ton-kilometers)

|                                  | Canada       |              |              | Mexico       |              |              | United States  |                |                |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|----------------|----------------|
|                                  | 1990         | 1995         | 1996         | 1990         | 1995         | 1996         | 1990           | 1995           | 1996           |
| <b>Total</b>                     | <b>520.7</b> | <b>602.8</b> | <b>614.3</b> | <b>154.1</b> | <b>206.0</b> | <b>212.7</b> | <b>5,070.0</b> | <b>5,784.7</b> | <b>5,916.2</b> |
| <b>Air</b>                       | <b>0.5</b>   | <b>0.6</b>   | <b>0.6</b>   | <b>0.9</b>   | <b>1.2</b>   | <b>1.0</b>   | <b>10.9</b>    | <b>15.6</b>    | <b>16.0</b>    |
| <b>Water transport</b>           | <b>53.7</b>  | <b>42.5</b>  | <b>40.2</b>  | <b>19.3</b>  | <b>20.0</b>  | <b>19.9</b>  | <b>1,217.0</b> | <b>1,179.3</b> | <b>1,116.4</b> |
| Coastal shipping                 | 14.0         | 10.5         | 10.3         | 19.3         | 20.0         | 19.9         | 699.5          | 642.9          | 595.8          |
| Great Lakes                      | 7.3          | 5.1          | 5.4          | NA           | NA           | NA           | 89.0           | 87.2           | 85.2           |
| Inland waterways <sup>a</sup>    | 32.4         | 26.9         | 24.5         | NA           | NA           | NA           | 428.5          | 449.2          | 435.5          |
| <b>Pipeline</b>                  | <b>212.2</b> | <b>273.9</b> | <b>280.6</b> | <b>U</b>     | <b>U</b>     | <b>U</b>     | <b>1,259.5</b> | <b>1,338.9</b> | <b>1,364.6</b> |
| Crude oil and petroleum products | 102.8        | 103.9        | 105.0        | U            | U            | U            | 852.8          | 877.6          | 904.0          |
| Natural gas                      | 109.4        | 170.0        | 175.6        | U            | U            | U            | 406.7          | 461.3          | 460.6          |
| <b>Rail</b>                      | <b>199.6</b> | <b>220.0</b> | <b>221.4</b> | <b>25.0</b>  | <b>22.0</b>  | <b>21.0</b>  | <b>1,509.6</b> | <b>1,906.3</b> | <b>1,979.7</b> |
| <b>Road</b>                      | <b>54.7</b>  | <b>65.8</b>  | <b>71.5</b>  | <b>108.9</b> | <b>162.8</b> | <b>170.8</b> | <b>1,073.1</b> | <b>1,344.6</b> | <b>1,439.5</b> |

<sup>a</sup>Commercially navigable.

**KEY:** NA = Not applicable. U = Data are unavailable.

### NOTES

#### Canada

Road: Data include only activity of Canadian domiciled for-hire carriers with annual intercity revenues greater than or equal to 1 million Canadian dollars. Data excludes local (less than 24 kilometers) deliveries, and deliveries made by private trucks and small for-hire carriers.

Pipeline: Data are for both oil pipelines and natural gas.

#### Mexico

Total: Does not include data for pipelines because the data are unavailable.

Road: Includes only intercity truck activity on the Mexican federal highway system.

#### United States

Pipeline: Data are for both oil pipelines and natural gas.

Road: Data are for *intercity* for-hire and private truck only.

### SOURCES

#### Canada

Air: Statistics Canada. *Canadian Civil Aviation, Catalogue No. 51-206-XPB*. (Ottawa, Ont.: various years).

Coastal shipping, Great Lakes and inland waterways and rail: Transport Canada. Economic Analysis Directorate based on Statistics Canada data. (Ottawa, Ont.: 1998).

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue 55-201-XPB*, and *Gas Utilities Transport and Distribution Systems, Catalogue No. 57-205-XPB*. (Ottawa, Ont.: various years).

Rail: Transport Canada. Economic Analysis Directorate, based on Statistics Canada data. (Ottawa, Ont: 1998).

Road: Statistics Canada. *Trucking in Canada, Catalogue No. 53-222-XPB*. (Ottawa, Ont.: various years).

#### Mexico

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Rail: Secretaría de Comunicaciones y Transportes. Based on data from Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1998).

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**t a b l e** 5-2**Domestic Freight Activity by Mode**—*Continued***United States**

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: various years).

Coastal shipping, Great Lakes and inland waterways: U.S. Army Corps of Engineers. *Waterborne Commerce of the U.S., Part 5*. (New Orleans, LA: Annual issues).

Pipeline, crude oil and petroleum products: Association of Oil Pipe Lines. *Shifts in Petroleum Transportation*. (Washington, DC: various years).

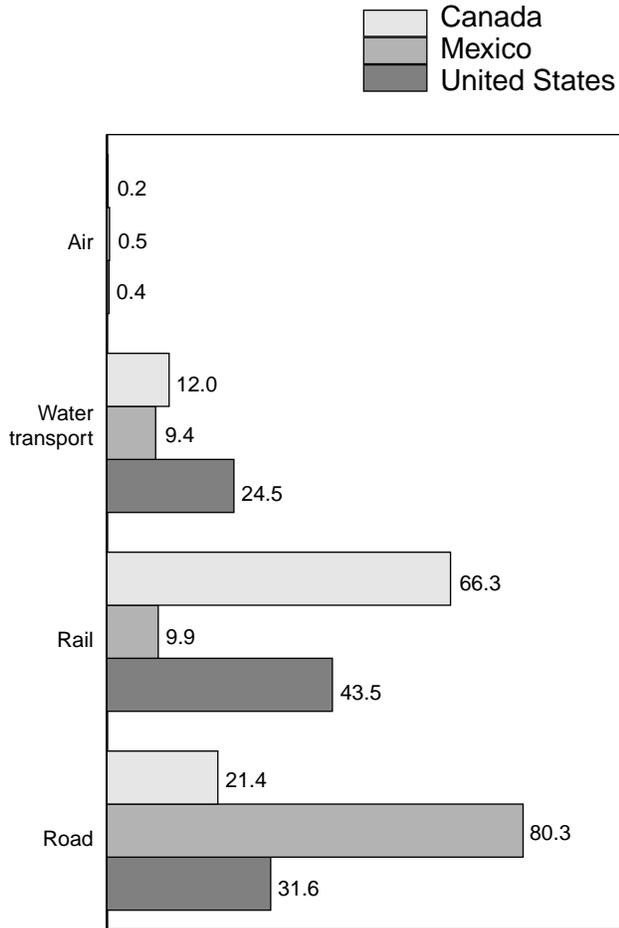
Pipeline, natural gas: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation based on Department of Energy data. (Washington, DC: 1999).

Rail: Association of American Railroads. *Railroad Facts, 1997*. (Washington, DC: 1997).

Road: Eno Transportation Foundation, Inc. *Transportation in America, 1997*. (Lansdowne, VA: 1997).

**figure** 5-2a

Percent Modal Share, Excluding Pipelines, of Total Metric Ton-Kilometers: 1996



Because pipeline data for Mexico are unavailable, pipeline has been excluded from each country's total for overall ton-kilometers and the derived modal shares in this figure. Figure 5-2b shows the modal shares for Canada and the United States when pipelines (both oil and gas) are included. Notes and sources: See Table 5-2.

**figure** 5-2b

Percent Modal Share, Including Pipelines, of Total Metric Ton-Kilometers: 1996

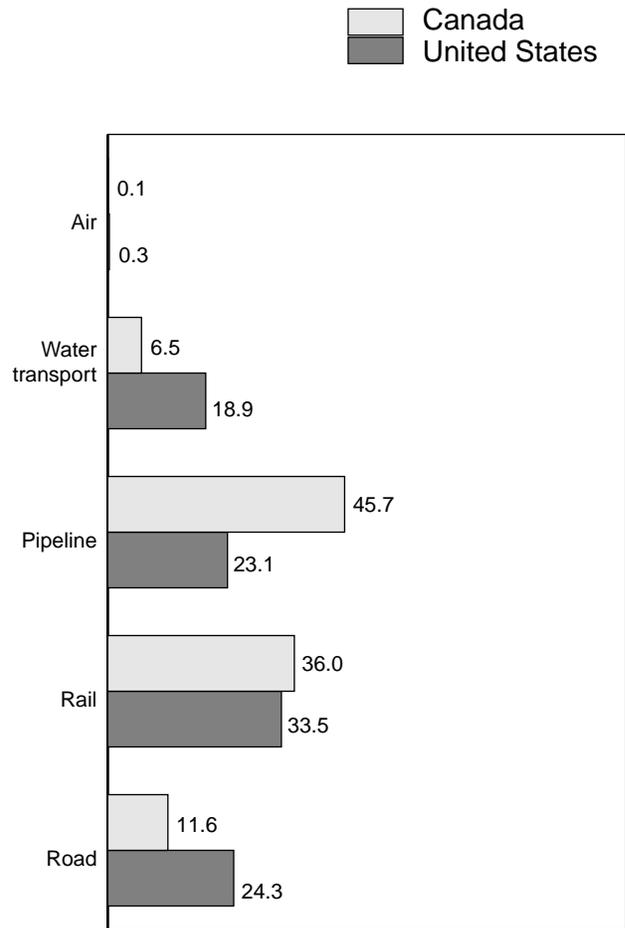


Figure 5-2b shows the modal shares for Canada and the United States when pipelines (both oil and gas) are included. Figure 5-2b more accurately portrays modal shares for Canada and the United States than figure 5-2a, which excludes pipeline data. Notes and sources: See Table 5-2.

**t a b l e** 5-3a

## Top Canadian Domestic Freight Commodities by Mode: 1996

(Millions of metric tons)

| Mode of transportation        | Total | Mode of transportation         | Total |
|-------------------------------|-------|--------------------------------|-------|
| <b>Air</b>                    |       | <b>Road</b>                    |       |
| N                             | N     | Forest products                | 40.3  |
|                               |       | Live animals and food products | 24.0  |
| <b>Pipeline</b>               |       | Petroleum products             | 23.1  |
| Natural gas                   | 120.1 | Construction materials         | 18.4  |
| Crude oil                     | 118.9 | Steel                          | 14.4  |
| Petroleum products            | 64.5  | <b>Water transport</b>         |       |
|                               |       | Iron ore                       | 7.0   |
| <b>Rail</b>                   |       | Pulpwood and chips             | 6.7   |
| Bituminous coal               | 39.8  | Wheat                          | 4.8   |
| Iron ore and concentrates     | 37.4  | Stone and limestone            | 4.7   |
| Wheat                         | 20.3  | Fuel oil                       | 4.3   |
| Muriate of potassium (potash) | 12.3  | <b>Intermodal</b>              |       |
| Pulpwood and chips            | 11.7  | N                              | N     |

**KEY:** N = Data are nonexistent.**SOURCES**

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue No. 55-201-XPB, 1996.* (Ottawa, Ont.: 1997). Statistics Canada. *Gas Utilities, Transport and Distribution Systems, Catalogue No. 57-205-XPB, 1996.* (Ottawa, Ont.: 1997).

Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB, 1996.* (Ottawa, Ont.: 1998).

Road: Statistics Canada. Transportation Division. Special for-hire trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada's Marine Database.)

**t a b l e** 5-3b

## Top Mexican Domestic Freight Commodities by Mode: 1996

(Millions of metric tons)

| Mode of transportation | Total | Mode of transportation              | Total |
|------------------------|-------|-------------------------------------|-------|
| <b>Air</b>             |       | <b>Road</b>                         |       |
| N                      | N     | Miscellaneous manufactured articles | 51.2  |
|                        |       | Salt, sulfur, plaster and cement    | 36.0  |
| <b>Pipeline</b>        |       | Mineral fuels, oils and waxes       | 28.9  |
| Crude oil              | U     | Edible fruits and vegetables        | 19.9  |
| Natural gas            | U     | Beverages, spirits and vinegar      | 18.6  |
| Petroleum products     | U     | <b>Water transport</b>              |       |
|                        |       | Crude oil and petroleum products    | 19.4  |
| <b>Rail</b>            |       | Limestone                           | 7.3   |
| Cement                 | 9.3   | Salt                                | 6.3   |
| Corn                   | 5.9   | Iron ore pellets                    | 1.4   |
| Iron ore               | 3.9   | Cement                              | 0.1   |
| Coal                   | 2.8   | <b>Intermodal</b>                   |       |
| Fuel oil               | 2.4   | N                                   | N     |

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

### NOTES

Road and water transport: Data are for 1993.

Road and rail: Data include foreign trade merchandise.

### SOURCES

Rail: Secretaría de Comunicaciones y Transportes. Based on data from the Ferrocarriles Nacionales de México. *Series Estadísticas, 1996*. (Mexico City, D.F.: 1997).

Road: Instituto Mexicano del Transporte based on the vehicle's weight and dimensions study. (Sanfandila, Qro.: 1997).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

**t a b l e** 5-3c

## Top U.S. Domestic Freight Commodities by Mode: 1993

(Millions of metric tons)

| Mode of transportation  | Total | Mode of transportation                        | Total   |
|---|-------|---|---------|
| <b>Air</b>  |       | <b>Road</b>                                   |         |
| Machinery, excluding electricals                                  | 0.46  | Nonmetallic minerals                          | 1,364.6 |
| Chemicals or allied products                                      | 0.32  | Petroleum or coal products                    | 900.6   |
| Electrical machinery, equipment or supplies                       | 0.25  | Food or kindred products                      | 674.2   |
| Transportation equipment  | 0.24  | Lumber or wood products, excluding furniture  | 529.0   |
| Instruments, photographic and optical goods,<br>watches or clocks | 0.09  | Chemicals or allied products                  | 281.7   |
|   |       | <b>Water transport</b>                        |         |
| <b>Pipeline</b>   |       | Petroleum and petroleum products              | 844.2   |
| Crude oil   | 925.0 | Crude materials                               | 327.1   |
| Petroleum products  | 771.9 | Coal  | 272.5   |
| Natural gas   | 502.6 | Food and farm products                        | 244.3   |
|   |       | Chemicals and related products                | 119.4   |
| <b>Rail</b>   |       | <b>Intermodal (road and rail combination)</b> |         |
| Coal  | 572.5 | Transportation equipment                      | 6.9     |
| Farm products   | 158.7 | Chemicals or allied products                  | 1.9     |
| Nonmetallic minerals  | 131.5 | Food or kindred products                      | 1.7     |
| Petroleum or coal products  | 123.6 | Lumber or wood products, excluding furniture  | 1.5     |
| Chemicals or allied products                                      | 118.2 | Pulp, paper or allied products                | 1.4     |

### SOURCES

Air, road and rail: U.S. Department of Commerce. U.S. Census Bureau. *1993 Commodity Flow Survey*. Special tabulation. (Washington, DC: 1998).

Pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation. (Washington, DC: 1998).

Water transport: U.S. Army Corps of Engineers (USACE). *Waterborne Commerce of the United States, Calendar Year 1996; Part 5 - National Summaries*. (New Orleans, LA: 1997).

**t a b l e** 5-4a

## Top Canadian Domestic Freight Interprovincial Pairs by Mode: 1996

(Thousands of metric tons)

| Mode of transportation           | Total  | Mode of transportation       | Total |
|----------------------------------|--------|------------------------------|-------|
| <b>Air</b>                       |        | Québec to Ontario            | 6,845 |
| N                                | N      | Alberta to British Columbia  | 3,048 |
|                                  |        | British Columbia to Alberta  | 2,060 |
| <b>Pipeline</b>                  |        | Alberta to Saskatchewan      | 1,781 |
| N                                | N      |                              |       |
| <b>Rail</b>                      |        | <b>Water transport</b>       |       |
| Alberta to British Columbia      | 29,335 | Ontario to Québec            | 6,187 |
| Newfoundland to Québec           | 20,875 | Québec to Ontario            | 5,963 |
| Saskatchewan to British Columbia | 12,890 | Nova Scotia to Newfoundland  | 810   |
| Saskatchewan to Ontario          | 8,249  | Nova Scotia to Québec        | 745   |
| Ontario to Québec                | 4,677  | Nova Scotia to New Brunswick | 680   |
| <b>Road</b>                      |        | <b>Intermodal</b>            |       |
| Ontario to Québec                | 7,002  | N                            | N     |

**KEY:** N = Data are nonexistent.

**NOTE:** Data represent one-way flows.

### SOURCES

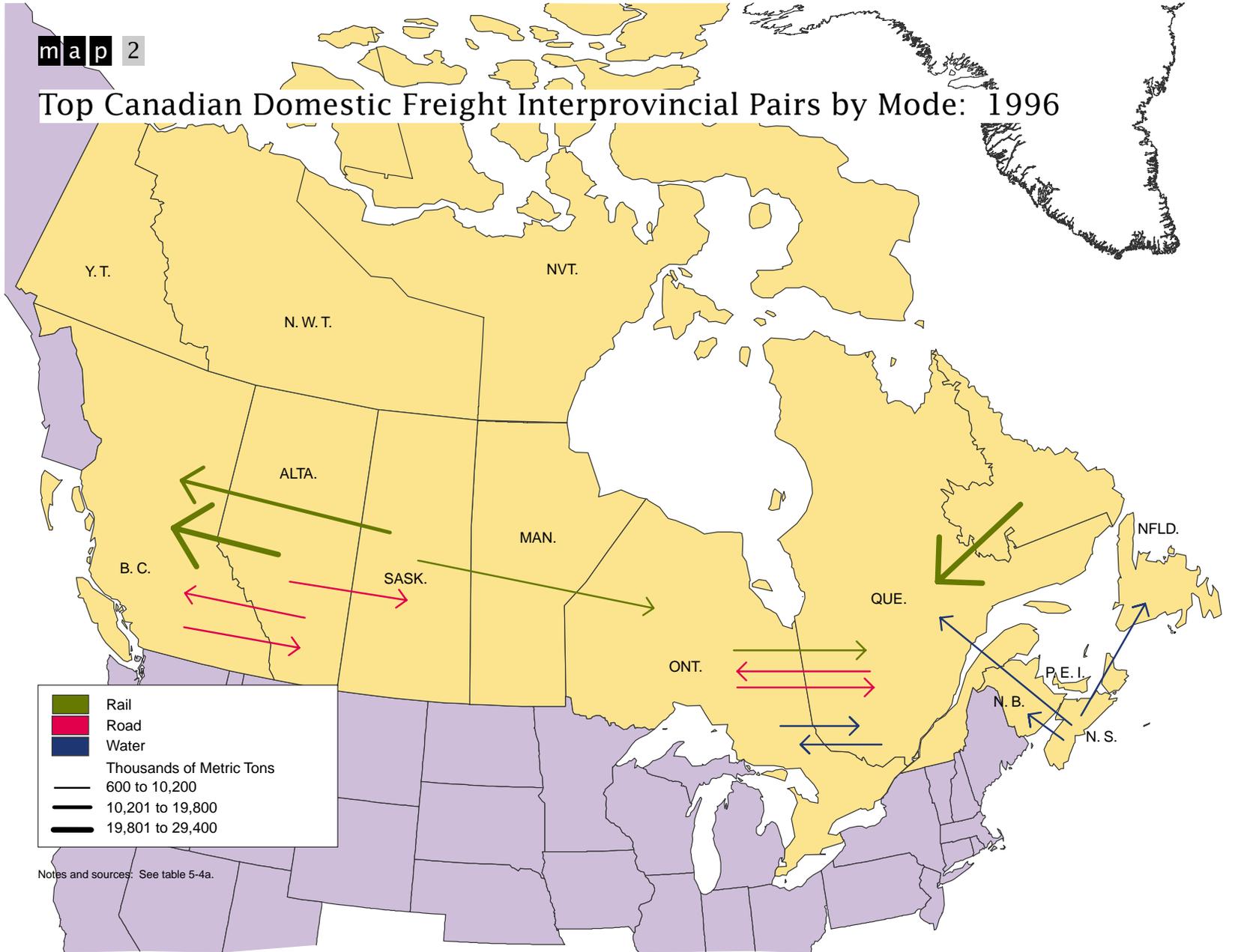
Rail: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Rail data adapted by Transport Canada from Statistics Canada sources.)

Road: Statistics Canada. Transportation Division. Special for-hire trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada's Marine Database.)

map 2

# Top Canadian Domestic Freight Interprovincial Pairs by Mode: 1996



**t a b l e** 5-4b

## Top U.S. Domestic Freight Interstate Pairs by Mode: 1993

(Thousands of metric tons)

| Mode of transportation    | Total  | Mode of transportation             | Total  |
|---------------------------|--------|------------------------------------|--------|
| <b>Air</b>                |        | Illinois to Indiana                | 18,008 |
| California to Texas       | 39     | Pennsylvania to New Jersey         | 16,991 |
| California to New Jersey  | 27     | Michigan to Ohio                   | 15,056 |
| Indiana to California     | 22     | New Jersey to New York             | 14,587 |
| New Jersey to California  | 16     | <b>Water transport</b>             |        |
| California to Georgia     | 15     | Illinois to Louisiana              | 18,416 |
| <b>Pipeline</b>           |        | Missouri to Louisiana              | 11,088 |
| N                         | N      | West Virginia to Pennsylvania      | 10,938 |
| <b>Rail</b>               |        | Louisiana to Texas                 | 8,828  |
| Wyoming to Texas          | 37,608 | Iowa to Louisiana                  | 8,628  |
| West Virginia to Virginia | 21,640 | <b>Intermodal</b>                  |        |
| Wyoming to Kansas         | 19,472 | <b>(road and rail combination)</b> |        |
| Wyoming to Missouri       | 18,507 | Kentucky to Michigan               | 988    |
| Illinois to Indiana       | 17,200 | California to Michigan             | 313    |
| <b>Road</b>               |        | Ohio to California                 | 298    |
| Indiana to Illinois       | 25,978 | Illinois to California             | 261    |
|                           |        | Michigan to Florida                | 163    |

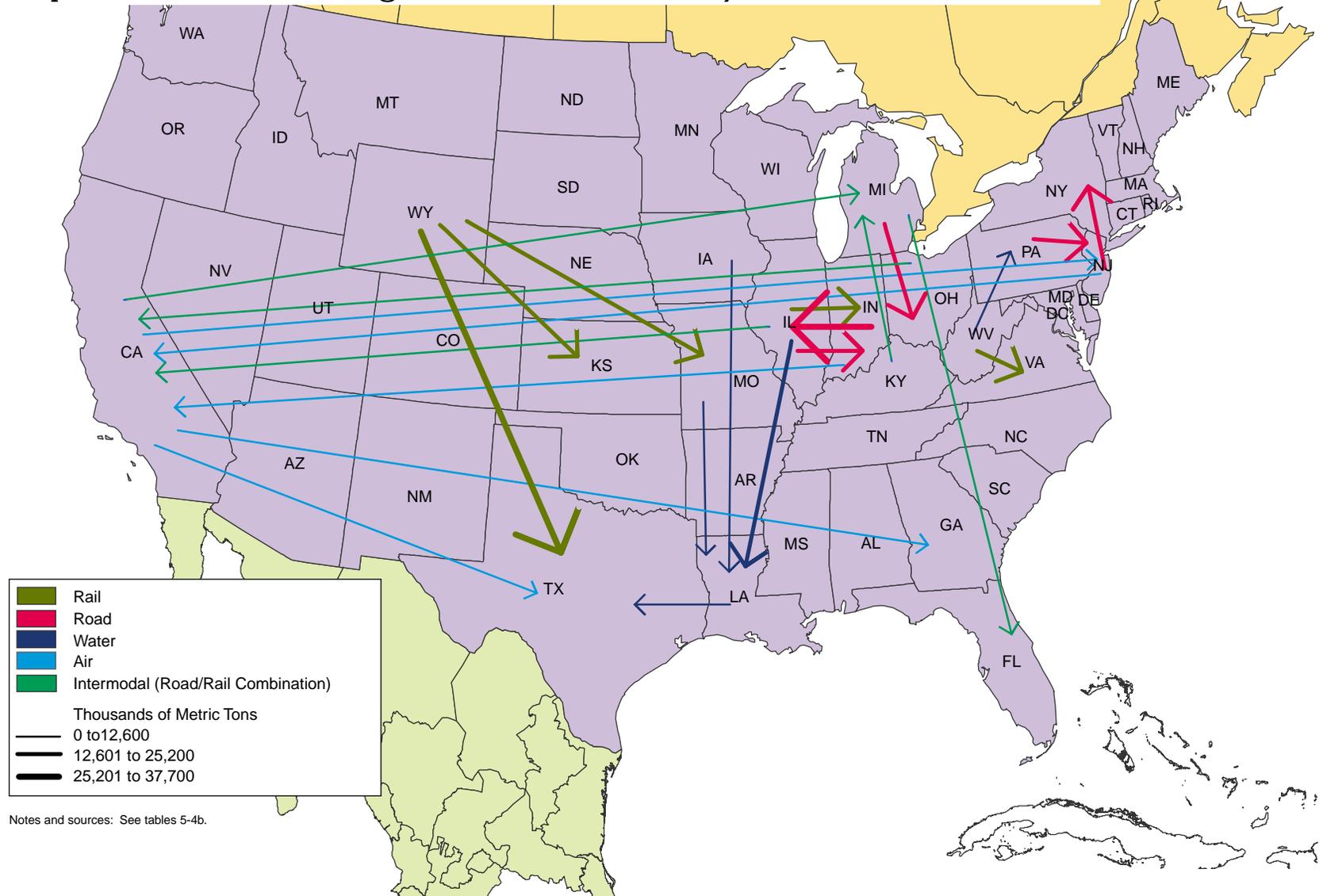
**KEY:** N = Data are nonexistent.

**NOTE:** Data represent one-way flows.

**SOURCE:** U.S. Department of Commerce. U.S. Census Bureau. *1993 Commodity Flow Survey*. Special tabulation. (Washington, DC: 1998).

map 3

Top U.S. Domestic Freight Interstate Pairs by Mode: 1993



**t a b l e** 5-5a

## Top Canadian Domestic Freight Area Pairs by Mode: 1996

(Thousands of metric tons)

| Mode of transportation          | Total | Mode of transportation                                     | Total |
|---------------------------------|-------|--|-------|
| <b>Air</b>                      |       | Toronto, Ont. to Hamilton, Ont.                            | 964   |
| N                               | N     | Montréal, Que. to Québec, Que.                             | 919   |
| <b>Pipeline</b>                 |       | <b>Water transport</b>                                     |       |
| N                               | N     | Sept-Îles/Pte-Noire, Que. to Hamilton, Ont.                | 3,294 |
|                                 |       | Havre-St-Pierre, Que. to Sorel, Que.                       | 2,447 |
| <b>Rail</b>                     |       | Port-Cartier, Que. to Hamilton, Ont.                       | 2,065 |
| N                               | N     | Colborne, Ont. to Clarkson, Ont.                           | 1,824 |
| <b>Road</b>                     |       | Fraser River, B.C. to East Coast<br>Vancouver Island, B.C. | 1,625 |
| Hamilton, Ont. to Toronto, Ont. | 2,716 | <b>Intermodal</b>  |       |
| Toronto, Ont. to Montréal, Que. | 2,061 | N  | N     |
| Montréal, Que. to Toronto, Ont. | 1,623 |  |       |

**KEY:** N = Data are nonexistent.

**NOTE:** Data represent one-way flows. Water data represent port to port pairs rather than metropolitan area pairs.

### SOURCES

Road: Statistics Canada. Transportation Division. Special for-hire trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada's Marine Database.)

**t a b l e** 5-5b

## Top Mexican Domestic Freight Area Pairs by Mode: 1996

(Thousands of metric tons)

| Mode of transportation                    | Total | Mode of transportation                         | Total  |
|---|-------|--|--------|
| <b>Air</b>                                |       | <b>Road</b>                                    |        |
| Mexico City, D.F. to Guadalajara, Jal.    | 6     | Mexico City, D.F. to Nuevo Laredo, Tamps.      | 12,700 |
| Mexico City, D.F. to Tijuana, B.C.        | 5     | Mexico City, D.F. to Monterrey, N.L.           | 7,400  |
| Mexico City, D.F. to Cancún, Q. Roo.      | 4     | Mexico City, D.F. to Guadalajara, Jal.         | 6,100  |
| Guadalajara, Jal. to Mexico City, D.F.    | 4     | Mexico City, D.F. to Veracruz, Ver.            | 4,700  |
| Mexico City, D.F. to Monterrey, N.L.      | 4     | Mexico City, D.F. to Toluca, Edo. de Mex.      | 4,400  |
| <b>Pipeline</b>                           |       | <b>Water transport</b>                         |        |
| U   | U     | Guerrero Negro, B.C.S. to Isla de Cedros, B.C. | 7,400  |
| <b>Rail</b>                               |       | Pajaritos, Ver. to Tuxpan, Ver.                | 4,000  |
| Nuevo Laredo, Tamps. to Monterrey, N.L.   | 1,553 | Salina Cruz, Oax. to Guaymas, Son.             | 2,300  |
| Nuevo Laredo, Tamps. to Mexico City, D.F. | 1,271 | Salina Cruz, Oax. to Manzanillo, Col.          | 2,100  |
| Veracruz, Ver. to Mexico City, D.F.       | 803   | Salina Cruz, Oax. to Lázaro Cárdenas, Mich.    | 1,300  |
| Ciudad Sahagún, Hgo. to Mexico City, D.F. | 783   | <b>Intermodal</b>                              |        |
| Nuevo Laredo, Tamps. to Guadalajara, Jal. | 697   | N  | N      |

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

### NOTES

Data represent one-way flows.

Rail: Figures of 1993, based on allocation studies (see Appendix B).

Road: Figures of 1994, from a survey of motor carrier vehicles on federal roads (see Appendix B).

Water transport: Data represent port to port pairs rather than metropolitan area pairs.

### SOURCES

Air: Instituto Mexicano del Transporte based on special tabulation of the Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Sanfandila, Qro.: 1999).

Rail: Instituto Mexicano del Transporte. *Evaluación Económica de Mejoras a la Infraestructura del Sistema Nacional Ferroviario, Publicación Técnica No. 82*. Estimates included in this document are based on information from the Ferrocarriles Nacionales de México. (Sanfandila, Qro.: 1996).

Road: Instituto Mexicano del Transporte. Special tabulation from *Estudio de pesos y dimensiones de los vehiculos de carga que circulan en la red nacional de carreteras, 1994*. (Sanfandila, Qro.: 1999).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).





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s e c t i o n 6

North American  
Merchandise Trade



**t a b l e** 6-1a

## Canadian Merchandise Trade With Mexico and the United States by Mode of Transportation

(Millions of current U.S. dollars)

|   | 1990           | 1995           | 1996           |
|---|----------------|----------------|----------------|
| <b>Total trade with Mexico</b>            | <b>2,059</b>   | <b>4,735</b>   | <b>5,347</b>   |
| Air                                       | 146            | 374            | 375            |
| Water transport                           | 214            | 339            | 431            |
| Road                                      | 1,133          | 2,621          | 3,091          |
| Rail                                      | 544            | 1,326          | 1,328          |
| Pipeline and other <sup>a</sup>           | 22             | 75             | 121            |
| <b>Exports to Mexico</b>                  | <b>562</b>     | <b>835</b>     | <b>922</b>     |
| Air                                       | 87             | 143            | 122            |
| Water transport                           | 88             | 290            | 377            |
| Road                                      | 244            | 295            | 301            |
| Rail                                      | 142            | 108            | 122            |
| Pipeline and other <sup>a</sup>           | NS             | NS             | NS             |
| <b>Imports from Mexico</b>                | <b>1,497</b>   | <b>3,899</b>   | <b>4,426</b>   |
| Air                                       | 58             | 231            | 253            |
| Water transport                           | 126            | 49             | 54             |
| Road                                      | 889            | 2,326          | 2,791          |
| Rail                                      | 402            | 1,218          | 1,207          |
| Pipeline and other <sup>a</sup>           | 22             | 75             | 121            |
| <b>Total trade with the United States</b> | <b>170,897</b> | <b>261,168</b> | <b>278,871</b> |
| Air                                       | 10,066         | 16,600         | 17,912         |
| Water transport                           | 6,852          | 6,538          | 6,905          |
| Road                                      | 117,453        | 174,982        | 188,531        |
| Rail                                      | 25,818         | 48,436         | 47,184         |
| Pipeline and other <sup>a</sup>           | 10,709         | 14,612         | 18,339         |
| <b>Exports to the United States</b>       | <b>95,611</b>  | <b>151,388</b> | <b>163,682</b> |
| Air                                       | 3,466          | 7,142          | 7,315          |
| Water transport                           | 5,096          | 4,936          | 5,134          |
| Road                                      | 60,585         | 87,075         | 96,534         |
| Rail                                      | 18,473         | 37,968         | 37,050         |
| Pipeline and other <sup>a</sup>           | 7,991          | 14,267         | 17,648         |
| <b>Imports from the United States</b>     | <b>75,286</b>  | <b>109,780</b> | <b>115,188</b> |
| Air                                       | 6,600          | 9,458          | 10,597         |
| Water transport                           | 1,756          | 1,601          | 1,771          |
| Road                                      | 56,868         | 87,907         | 91,997         |
| Rail                                      | 7,345          | 10,469         | 10,134         |
| Pipeline and other <sup>a</sup>           | 2,718          | 345            | 691            |

<sup>a</sup>Mostly pipeline; also includes mail, parcel post and other miscellaneous modes of transportation.**KEY:** NS = Not significant.**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**t a b l e** 6-1b

## Mexican Merchandise Trade With Canada and the United States by Mode of Transportation

(Millions of current U.S. dollars)

|   | 1990 <sup>a</sup> | 1995           | 1996 <sup>p</sup> |
|---|-------------------|----------------|-------------------|
| <b>Total trade with Canada</b>            | <b>917</b>        | <b>3,354</b>   | <b>3,914</b>      |
| Air                                       | U                 | 264            | 237               |
| Water transport                           | U                 | 381            | 551               |
| Road                                      | U                 | 1,174          | 1,501             |
| Rail                                      | U                 | 1,301          | 1,467             |
| Pipeline                                  | NA                | NA             | NA                |
| <b>Exports to Canada</b>                  | <b>458</b>        | <b>1,979</b>   | <b>2,170</b>      |
| Air                                       | U                 | 94             | 103               |
| Water transport                           | U                 | 118            | 181               |
| Road                                      | U                 | 557            | 606               |
| Rail                                      | U                 | 1,094          | 1,272             |
| Pipeline                                  | NA                | NA             | NA                |
| <b>Imports from Canada</b>                | <b>458</b>        | <b>1,374</b>   | <b>1,744</b>      |
| Air                                       | U                 | 170            | 134               |
| Water transport                           | U                 | 263            | 370               |
| Road                                      | U                 | 617            | 895               |
| Rail                                      | U                 | 207            | 195               |
| Pipeline                                  | NA                | NA             | NA                |
| <b>Total trade with the United States</b> | <b>38,909</b>     | <b>120,142</b> | <b>147,977</b>    |
| Air                                       | U                 | 3,544          | 4,438             |
| Water transport                           | U                 | 10,905         | 14,620            |
| Road                                      | U                 | 85,034         | 101,933           |
| Rail                                      | U                 | 12,345         | 17,541            |
| Pipeline                                  | U                 | U              | U                 |
| <b>Exports to the United States</b>       | <b>18,418</b>     | <b>66,336</b>  | <b>80,541</b>     |
| Air                                       | U                 | 1,794          | 2,097             |
| Water transport                           | U                 | 8,655          | 11,306            |
| Road                                      | U                 | 46,272         | 53,752            |
| Rail                                      | U                 | 8,784          | 12,681            |
| Pipeline                                  | U                 | U              | U                 |
| <b>Imports from the United States</b>     | <b>20,491</b>     | <b>53,806</b>  | <b>67,437</b>     |
| Air                                       | U                 | 1,750          | 2,341             |
| Water transport                           | U                 | 2,250          | 3,314             |
| Road                                      | U                 | 38,762         | 48,181            |
| Rail                                      | U                 | 3,561          | 4,859             |
| Pipeline                                  | U                 | U              | U                 |

<sup>a</sup>Data for 1990 does not include maquiladora trade.**KEY:** NA = Not applicable. p = Data are preliminary. U = Data are unavailable.

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**t a b l e 6-1b**

**Mexican Merchandise Trade With Canada and the United States by Mode of Transportation—Continued**

**NOTES**

See Appendix B for information on the proportion of maquiladora trade in 1995 and 1996.

Mexican total merchandise trade with Canada and the United States: Individual modes do not sum to total trade figures because not all Mexican modes of transportation are included here. See Appendix B for Mexican modes not specifically identified on this table.

**SOURCE:** Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**t a b l e** 6-1c

## U.S. Merchandise Trade With Canada and Mexico by Mode of Transportation

(Millions of current U.S. dollars)

|                                | 1990           | 1995           | 1996           |
|--------------------------------|----------------|----------------|----------------|
| <b>Total trade with Canada</b> | <b>175,054</b> | <b>272,575</b> | <b>290,194</b> |
| Air                            | 8,938          | 17,074         | 18,866         |
| Water transport                | 10,969         | 6,558          | 7,034          |
| Road                           | N              | 186,388        | 201,144        |
| Rail                           | N              | 55,269         | 55,490         |
| Pipeline                       | N              | 10,728         | 12,958         |
| <b>Exports to Canada</b>       | <b>83,674</b>  | <b>127,226</b> | <b>133,688</b> |
| Air                            | 6,036          | 10,935         | 12,541         |
| Water transport                | 1,938          | 1,882          | 2,066          |
| Road                           | N              | 97,423         | 102,743        |
| Rail                           | N              | 15,272         | 15,679         |
| Pipeline                       | N              | 121            | 162            |
| <b>Imports from Canada</b>     | <b>91,380</b>  | <b>145,349</b> | <b>156,506</b> |
| Air                            | 2,902          | 6,139          | 6,325          |
| Water transport                | 9,032          | 4,676          | 4,968          |
| Road                           | N              | 88,965         | 98,401         |
| Rail                           | N              | 39,997         | 39,811         |
| Pipeline                       | N              | 10,607         | 12,796         |
| <b>Total trade with Mexico</b> | <b>58,346</b>  | <b>107,977</b> | <b>129,724</b> |
| Air                            | 1,950          | 3,158          | 4,232          |
| Water transport                | 7,291          | 9,914          | 11,941         |
| Road                           | N              | 78,929         | 92,442         |
| Rail                           | N              | 13,832         | 17,417         |
| Pipeline                       | N              | 28             | 10             |
| <b>Exports to Mexico</b>       | <b>28,279</b>  | <b>46,292</b>  | <b>56,761</b>  |
| Air                            | 1,378          | 1,775          | 2,362          |
| Water transport                | 1,527          | 2,200          | 3,143          |
| Road                           | N              | 35,914         | 44,092         |
| Rail                           | N              | 4,694          | 5,119          |
| Pipeline                       | N              | 1              | 2              |
| <b>Imports from Mexico</b>     | <b>30,157</b>  | <b>61,685</b>  | <b>72,963</b>  |
| Air                            | 572            | 1,382          | 1,870          |
| Water transport                | 5,764          | 7,713          | 8,797          |
| Road                           | N              | 43,014         | 48,350         |
| Rail                           | N              | 9,138          | 12,298         |
| Pipeline                       | N              | 27             | 8              |

**KEY:** N = Data are nonexistent.

**NOTE:** Total trade with Canada and Mexico: Individual modes do not sum to total trade figures because not all U.S. modes of transportation are included here. See Appendix B for a list of U.S. modes not specifically identified on this table. In addition, in some cases, a summation of the individual modal categories will exceed the reported total trade value because transshipment data are included in the data for land modes of transportation (road, rail and pipeline). Transshipment data cannot be separated from the modal totals for road, rail and pipeline for 1995 and 1996. For an explanation of transshipment data, see Appendix B. Also see Appendix B for information on modal percentage shares, using 1997 data from which transshipment data have been excluded from the land modes.

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**t a b l e** 6-1c

**U.S. Merchandise Trade With Canada and Mexico  
by Mode of Transportation—Continued**

**SOURCES**

Total trade: U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States*. (Washington, DC: 1990, 1995 and 1996).

Air and water: U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *FT920 U.S. Merchandise Trade*. (Washington, DC: December 1990, 1995 and 1996).

Road, rail and pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

**t a b l e** 6-2a

## Canadian Merchandise Trade With Mexico and the United States by Mode of Transportation

(Thousands of metric tons)

|   | 1990 <sup>e</sup> | 1995 <sup>e</sup> | 1996 <sup>e</sup> |
|---|-------------------|-------------------|-------------------|
| <b>Total trade with Mexico</b>            | <b>2,054</b>      | <b>4,621</b>      | <b>4,669</b>      |
| Air                                       | 28                | 73                | 46                |
| Water transport                           | 1,304             | 2,509             | 2,597             |
| Road                                      | 416               | 949               | 777               |
| Rail                                      | 290               | 442               | 375               |
| Pipeline and other <sup>a</sup>           | 16                | 649               | 875               |
| <b>Exports to Mexico</b>                  | <b>692</b>        | <b>2,231</b>      | <b>2,184</b>      |
| Air                                       | 7                 | 24                | 5                 |
| Water transport                           | 459               | 1,892             | 1,946             |
| Road                                      | 78                | 144               | 79                |
| Rail                                      | 149               | 170               | 154               |
| Pipeline and other <sup>a</sup>           | NS                | NS                | NS                |
| <b>Imports from Mexico</b>                | <b>1,362</b>      | <b>2,390</b>      | <b>2,485</b>      |
| Air                                       | 22                | 50                | 41                |
| Water transport                           | 846               | 616               | 651               |
| Road                                      | 338               | 804               | 698               |
| Rail                                      | 141               | 271               | 221               |
| Pipeline and other <sup>a</sup>           | 16                | 649               | 875               |
| <b>Total trade with the United States</b> | <b>245,811</b>    | <b>354,346</b>    | <b>367,986</b>    |
| Air                                       | 2,717             | 2,458             | 2,379             |
| Water transport                           | 67,893            | 72,495            | 77,371            |
| Road                                      | 67,113            | 95,450            | 98,126            |
| Rail                                      | 40,948            | 60,327            | 61,232            |
| Pipeline and other <sup>a</sup>           | 67,141            | 123,616           | 128,879           |
| <b>Exports to the United States</b>       | <b>175,621</b>    | <b>268,486</b>    | <b>277,525</b>    |
| Air                                       | 180               | 417               | 205               |
| Water transport                           | 40,047            | 45,260            | 48,414            |
| Road                                      | 38,441            | 51,939            | 54,305            |
| Rail                                      | 32,281            | 48,323            | 49,535            |
| Pipeline and other <sup>a</sup>           | 64,672            | 122,546           | 125,065           |
| <b>Imports from the United States</b>     | <b>70,191</b>     | <b>85,860</b>     | <b>90,461</b>     |
| Air                                       | 2,537             | 2,041             | 2,173             |
| Water transport                           | 27,846            | 27,236            | 28,956            |
| Road                                      | 28,671            | 43,510            | 43,821            |
| Rail                                      | 8,667             | 12,004            | 11,697            |
| Pipeline and other <sup>a</sup>           | 2,470             | 1,070             | 3,814             |

<sup>a</sup>Mostly pipeline moves; also includes mail, parcel post and other miscellaneous modes of transportation.

**KEY:** e = Data are estimated. NS = Not significant.

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**t a b l e** 6-2b

## Mexican Merchandise Trade With Canada and the United States by Mode of Transportation

(Thousands of metric tons)

|   | 1990            | 1995                | 1996     |
|---|-----------------|---------------------|----------|
| <b>Total trade with Canada</b>            | <b>N</b>        | <b>N</b>            | <b>N</b> |
| Air                                       | <sup>a</sup> 2  | 2                   | 2        |
| Water transport                           | 1,425           | <sup>b</sup> 3,427  | 2,808    |
| Road                                      | N               | N                   | N        |
| Rail                                      | U               | U                   | U        |
| Pipeline                                  | NA              | NA                  | NA       |
| <b>Exports to Canada</b>                  | <b>N</b>        | <b>N</b>            | <b>N</b> |
| Air                                       | <sup>a</sup> 1  | 1                   | 1        |
| Water transport                           | 1,051           | <sup>b</sup> 1,717  | 988      |
| Road                                      | N               | N                   | N        |
| Rail                                      | U               | U                   | U        |
| Pipeline                                  | NA              | NA                  | NA       |
| <b>Imports from Canada</b>                | <b>N</b>        | <b>N</b>            | <b>N</b> |
| Air                                       | <sup>a</sup> 1  | 1                   | 1        |
| Water transport                           | 374             | <sup>b</sup> 1,710  | 1,820    |
| Road                                      | N               | N                   | N        |
| Rail                                      | U               | U                   | U        |
| Pipeline                                  | NA              | NA                  | NA       |
| <b>Total trade with the United States</b> | <b>N</b>        | <b>N</b>            | <b>N</b> |
| Air                                       | <sup>a</sup> 70 | 116                 | 141      |
| Water transport                           | 59,270          | <sup>b</sup> 72,473 | 89,902   |
| Road                                      | N               | N                   | 38,728   |
| Rail                                      | U               | U                   | 15,120   |
| Pipeline                                  | U               | U                   | U        |
| <b>Exports to the United States</b>       | <b>N</b>        | <b>N</b>            | <b>N</b> |
| Air                                       | <sup>a</sup> 30 | 60                  | 74       |
| Water transport                           | 49,699          | <sup>b</sup> 61,698 | 77,648   |
| Road                                      | N               | N                   | 14,482   |
| Rail                                      | U               | U                   | 4,813    |
| Pipeline                                  | U               | U                   | U        |
| <b>Imports from the United States</b>     | <b>N</b>        | <b>N</b>            | <b>N</b> |
| Air                                       | <sup>a</sup> 40 | 56                  | 67       |
| Water transport                           | 9,571           | <sup>b</sup> 10,775 | 12,254   |
| Road                                      | N               | N                   | 24,246   |
| Rail                                      | U               | U                   | 10,307   |
| Pipeline                                  | U               | U                   | U        |

<sup>a</sup>Data for 1990 are nonexistent. Data in this table represent 1992.<sup>b</sup>Data for 1995 are nonexistent. Data in this table represent 1994.**KEY:** N = Data are nonexistent. NA = Not applicable. U = Data are unavailable.

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**t a b l e** 6-2b

**Mexican Merchandise Trade With Canada and the  
United States by Mode of Transportation—Continued**

**SOURCES**

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. Special tabulation. (Mexico City, D.F.: 1997).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1998).

Road and rail, 1996: Instituto Mexicano del Transporte. Special tabulations based on data from the Secretaría de Comercio y Fomento Industrial and U.S. Bureau of Transportation Statistics. (Querétaro, Qro.: 1998).

**t a b l e** 6-2c

## U.S. Merchandise Trade With Canada and Mexico by Mode of Transportation

(Thousands of metric tons)

|                                | 1990     | 1995     | 1996     |
|--------------------------------|----------|----------|----------|
| <b>Total trade with Canada</b> | <b>N</b> | <b>N</b> | <b>N</b> |
| Air                            | 222      | 252      | 269      |
| Water transport                | 65,447   | 68,509   | 72,013   |
| Road                           | N        | N        | N        |
| Rail                           | N        | N        | N        |
| Pipeline                       | N        | N        | N        |
| <b>Exports to Canada</b>       | <b>N</b> | <b>N</b> | <b>N</b> |
| Air                            | 171      | 215      | 225      |
| Water transport                | 25,194   | 25,721   | 24,906   |
| Road                           | N        | N        | N        |
| Rail                           | N        | N        | N        |
| Pipeline                       | N        | N        | N        |
| <b>Imports from Canada</b>     | <b>N</b> | <b>N</b> | <b>N</b> |
| Air                            | 51       | 38       | 44       |
| Water transport                | 40,253   | 42,788   | 47,108   |
| Road                           | N        | 53,564   | 57,805   |
| Rail                           | N        | 46,270   | 48,815   |
| Pipeline                       | N        | 61,385   | 62,889   |
| <b>Total trade with Mexico</b> | <b>N</b> | <b>N</b> | <b>N</b> |
| Air                            | 44       | 64       | 83       |
| Water transport                | 52,140   | 72,351   | 75,940   |
| Road                           | N        | N        | N        |
| Rail                           | N        | N        | N        |
| Pipeline                       | N        | N        | N        |
| <b>Exports to Mexico</b>       | <b>N</b> | <b>N</b> | <b>N</b> |
| Air                            | 26       | 28       | 37       |
| Water transport                | 9,026    | 8,632    | 13,097   |
| Road                           | N        | N        | N        |
| Rail                           | N        | N        | N        |
| Pipeline                       | N        | N        | N        |
| <b>Imports from Mexico</b>     | <b>N</b> | <b>N</b> | <b>N</b> |
| Air                            | 18       | 36       | 46       |
| Water transport                | 43,114   | 63,719   | 62,843   |
| Road                           | N        | N        | 14,482   |
| Rail                           | N        | N        | 4,814    |
| Pipeline                       | N        | N        | 113      |

**KEY:** N = Data are nonexistent.

### NOTES

Imports from Canada: The U.S. Customs Service began to require shipping weight for U.S. imports from Canada by all modes of transportation in 1990. However, it did not become possible to disaggregate the land modes (road, rail and pipeline) until 1994.

Imports from Mexico: The U.S. Customs Service began to require shipping weight for U.S. imports from Mexico by land modes of transportation (road, rail and pipeline) in April 1995.

Road, rail and pipeline exports: For 1990, 1995 and 1996, the U.S. Census Bureau did not require shippers to report weight for export shipments to Canada or Mexico for these modes of transportation.

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**t a b l e** 6-2c

**U.S. Merchandise Trade With Canada and Mexico  
by Mode of Transportation—Continued**

**SOURCES**

Total trade: U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States*. (Washington, DC: 1990, 1995 and 1996).

Air and water: U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *FT920 U.S. Merchandise Trade*. (Washington, DC: December 1990, 1995 and 1996).

Road, rail and pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

**t a b l e** 6-3a

## Top Canadian Gateways for North American Merchandise Trade by Mode: 1996

(Current value in millions of U.S. dollars)

| Port name                       | Exports   |                      |                      | Imports     |                        |                      | Total North American trade |
|---------------------------------|-----------|----------------------|----------------------|-------------|------------------------|----------------------|----------------------------|
|                                 | To Mexico | To the United States | Total North American | From Mexico | From the United States | Total North American |                            |
| <b>Air</b>                      |           |                      |                      |             |                        |                      |                            |
| Toronto-Pearson Int. Air, Ont.  | 63        | 4,125                | 4,188                | 151         | 4,149                  | 4,300                | 8,488                      |
| Montréal-Dorval Int. Air, Que.  | 19        | 1,422                | 1,441                | 23          | 1,984                  | 2,007                | 3,448                      |
| Montréal-Mirabel Int. Air, Que. | 5         | 726                  | 731                  | 10          | 678                    | 689                  | 1,420                      |
| Vancouver-Int. Airport, B.C.    | 1         | 344                  | 345                  | 9           | 860                    | 869                  | 1,214                      |
| Calgary, Alta.                  | 21        | 322                  | 343                  | 17          | 574                    | 590                  | 933                        |
| Hamilton, Ont.                  | 1         | 0                    | 1                    | 10          | 344                    | 354                  | 355                        |
| Winnipeg-Int. Airport, Man.     | 0         | 43                   | 43                   | 5           | 276                    | 280                  | 324                        |
| Ottawa, Ont.                    | 2         | 215                  | 217                  | 1           | 94                     | 95                   | 312                        |
| Edmonton, Alta.                 | 0         | 5                    | 6                    | 3           | 258                    | 260                  | 266                        |
| Halifax, N.S.                   | 0         | 25                   | 25                   | 0           | 98                     | 98                   | 124                        |
| <b>Water Transport</b>          |           |                      |                      |             |                        |                      |                            |
| Saint John, N.B.                | 1         | 1,213                | 1,214                | NS          | 27                     | 27                   | 1,241                      |
| Montréal-Main Long Room, Que.   | 18        | 321                  | 339                  | 24          | 146                    | 171                  | 510                        |
| Halifax, N.S.                   | 1         | 416                  | 417                  | 4           | 28                     | 33                   | 450                        |
| Sept-Îles, Que.                 | 0         | 376                  | 376                  | 1           | 34                     | 35                   | 411                        |
| Port Hawkesbury, N.S.           | 0         | 381                  | 381                  | NS          | 7                      | 7                    | 388                        |
| Hamilton, Ont.                  | NS        | NS                   | NS                   | 1           | 355                    | 355                  | 355                        |
| Nanaimo, B.C.                   | 0         | 345                  | 345                  | NS          | 5                      | 5                    | 351                        |
| Vancouver, B.C.                 | 0         | NS                   | NS                   | 9           | 233                    | 242                  | 242                        |
| Baie-Comeau, Que.               | 6         | 49                   | 56                   | NS          | 176                    | 176                  | 232                        |
| Sault Ste. Marie, Ont.          | 0         | NS                   | NS                   | NS          | 150                    | 150                  | 150                        |
| <b>Road</b>                     |           |                      |                      |             |                        |                      |                            |
| Windsor-Ambassador Bridge, Ont. | 185       | 34,769               | 34,955               | 1,409       | 30,648                 | 32,057               | 67,011                     |
| Fort Erie, Ont.                 | 17        | 19,094               | 19,112               | 72          | 10,024                 | 10,095               | 29,207                     |
| Sarnia, Ont.                    | 22        | 12,345               | 12,367               | 687         | 10,992                 | 11,679               | 24,046                     |
| Lacolle, Que.                   | 11        | 7,032                | 7,044                | 37          | 2,897                  | 2,934                | 9,978                      |
| Pacific Highway, B.C.           | 0         | 3,895                | 3,895                | 98          | 3,769                  | 3,867                | 7,763                      |
| Phillipsburg, Que.              | 0         | 4,393                | 4,393                | 6           | 1,872                  | 1,878                | 6,271                      |
| Emerson, Man.                   | 0         | 2,875                | 2,875                | 18          | 2,603                  | 2,620                | 5,496                      |
| Niagara Falls, Ont.             | 9         | 46                   | 56                   | 25          | 4,053                  | 4,078                | 4,133                      |
| Coutts, Alta.                   | 6         | 1,930                | 1,936                | 39          | 1,878                  | 1,917                | 3,853                      |
| North Portal, Sask.             | 9         | 1,655                | 1,664                | 7           | 1,687                  | 1,694                | 3,358                      |

**t a b l e** 6-3a

## Top Canadian Gateways for North American Merchandise Trade by Mode: 1996—*Continued*

(Current value in millions of U.S. dollars)

| Port name                         | Exports   |                      |                      | Imports     |                        |                      | Total North American trade |
|-----------------------------------|-----------|----------------------|----------------------|-------------|------------------------|----------------------|----------------------------|
|                                   | To Mexico | To the United States | Total North American | From Mexico | From the United States | Total North American |                            |
| <b>Rail</b>                       |           |                      |                      |             |                        |                      |                            |
| Sarnia, Ont.                      | 37        | 10,157               | 10,194               | 659         | 1,515                  | 2,174                | 12,368                     |
| Windsor-Ambassador Bridge, Ont.   | 9         | 8,207                | 8,216                | 420         | 1,278                  | 1,698                | 9,914                      |
| Fort Erie, Ont.                   | 0         | 7,296                | 7,296                | 2           | 41                     | 43                   | 7,339                      |
| Fort Frances, Ont.                | 60        | 3,257                | 3,316                | NS          | 64                     | 64                   | 3,380                      |
| Pacific Highway, B.C.             | 2         | 1,601                | 1,603                | 4           | 28                     | 32                   | 1,635                      |
| North Portal, Sask.               | 3         | 1,323                | 1,326                | NS          | 0                      | 0                    | 1,326                      |
| Huntington, B.C.                  | 0         | 1,143                | 1,143                | 0           | 180                    | 181                  | 1,323                      |
| Emerson, Man.                     | 3         | 964                  | 968                  | NS          | 119                    | 119                  | 1,087                      |
| Lacolle, Que.                     | 1         | 672                  | 673                  | NS          | 118                    | 118                  | 790                        |
| Montréal, Que.                    | 0         | NS                   | NS                   | 30          | 706                    | 736                  | 736                        |
| <b>Pipeline and other</b>         |           |                      |                      |             |                        |                      |                            |
| Coutts, Alta.                     | 0         | 3,188                | 3,188                | NS          | 1                      | 1                    | 3,189                      |
| Sarnia, Ont.                      | 0         | 2,314                | 2,314                | NS          | 232                    | 232                  | 2,546                      |
| Emerson, Man.                     | 0         | 2,092                | 2,092                | NS          | 1                      | 1                    | 2,093                      |
| Pacific Highway, B.C.             | 0         | 1,331                | 1,331                | NS          | 2                      | 2                    | 1,333                      |
| Lacolle, Que.                     | 0         | 1,125                | 1,125                | NS          | 0                      | 0                    | 1,125                      |
| Windsor-Ambassador Bridge, Ont.   | 0         | 918                  | 918                  | NS          | 4                      | 4                    | 922                        |
| Niagara Falls, Ont.               | 0         | 726                  | 726                  | 2           | 1                      | 2                    | 729                        |
| Prescott, Ont.                    | 0         | 674                  | 674                  | NS          | 0                      | 0                    | 674                        |
| Fort Erie, Ont.                   | 0         | 651                  | 651                  | NS          | 5                      | 5                    | 656                        |
| Windsor-Detroit/Can. Tunnel, Ont. | 0         | 238                  | 238                  | NS          | 0                      | 0                    | 238                        |

**KEY:** NS = Not significant.

**NOTE:** Pipeline and other: Includes mostly pipeline moves, but also includes mail, parcel post and other miscellaneous modes of transportation. It is not possible to separate pipeline data from these other modes of transportation.

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**t a b l e** 6-3b

## Top Mexican Gateways for North American Merchandise Trade by Mode: 1996<sup>P</sup>

(Current value in millions of U.S. dollars)

| Port name                             | Exports   |                      |                      | Imports     |                        |                      | Total North American trade |
|---------------------------------------|-----------|----------------------|----------------------|-------------|------------------------|----------------------|----------------------------|
|                                       | To Canada | To the United States | Total North American | From Canada | From the United States | Total North American |                            |
| <b>Air</b>                            |           |                      |                      |             |                        |                      |                            |
| Mexico City, D.F.                     | 34        | 573                  | 607                  | 97          | 1,344                  | 1,440                | 2,047                      |
| Guadalajara, Jal.                     | 50        | 939                  | 989                  | 28          | 589                    | 617                  | 1,606                      |
| Monterrey, N.L.                       | 17        | 122                  | 138                  | 5           | 114                    | 119                  | 257                        |
| Toluca, Edo. de Mex.                  | 1         | 131                  | 132                  | 2           | 49                     | 51                   | 183                        |
| <b>Water Transport</b>                |           |                      |                      |             |                        |                      |                            |
| Ciudad del Carmen, Camp. <sup>a</sup> | 137       | 5,477                | 5,613                | U           | 39                     | 39                   | 5,652                      |
| Coatzacoalcos, Ver.                   | 3         | 3,606                | 3,609                | 2           | 259                    | 261                  | 3,870                      |
| Veracruz, Ver.                        | 12        | 900                  | 912                  | 108         | 1,011                  | 1,119                | 2,031                      |
| Manzanillo Col.                       | 6         | 322                  | 328                  | 158         | 80                     | 238                  | 565                        |
| Tuxpan, Ver.                          | 0         | 5                    | 5                    | 1           | 545                    | 546                  | 551                        |
| Altamira, Tamps.                      | 3         | 181                  | 184                  | 7           | 357                    | 364                  | 548                        |
| Lázaro Cárdenas, Mich.                | 3         | 217                  | 220                  | 55          | 101                    | 156                  | 375                        |
| Guaymas, Son.                         | U         | 31                   | U                    | 21          | 52                     | 73                   | U                          |
| <b>Land</b>                           |           |                      |                      |             |                        |                      |                            |
| Nuevo Laredo, Tamps.                  | 792       | 18,145               | 18,937               | 722         | 16,188                 | 16,909               | 35,847                     |
| Ciudad Juárez, Chih.                  | 19        | 12,224               | 12,243               | 18          | 11,805                 | 11,823               | 24,066                     |
| Tijuana, B.C.                         | 16        | 8,433                | 8,449                | 49          | 5,764                  | 5,813                | 14,262                     |
| Matamoros, Tamps.                     | 25        | 3,729                | 3,754                | 47          | 4,624                  | 4,672                | 8,425                      |
| Ciudad Reynosa, Tamps.                | 34        | 3,621                | 3,655                | 22          | 3,394                  | 3,415                | 7,070                      |
| Piedras Negras, Coah.                 | 872       | 3,482                | 4,354                | 91          | 1,905                  | 1,996                | 6,350                      |
| Colombia, N.L.                        | 64        | 2,685                | 2,749                | 42          | 1,110                  | 1,152                | 3,901                      |

<sup>a</sup>Represents Cayo Arcas, Camp. which is an offshore platform for oil trade.

**KEY:** p = Data are preliminary. U = Data are unavailable.

### NOTES

**Air:** These four airports account for approximately 88 percent of Mexican trade by air with Canada and the United States. Data for other airports are unavailable.

**Water transport:** These eight water ports account for approximately 90 percent of Mexican trade by water with Canada and the United States. Data for other water ports are unavailable.

**Land:** Data are unavailable to separate land ports by the specific modes of road, rail and pipeline. Land data in this table include both road and rail modes.

**SOURCE:** Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**t a b l e** 6-3c

## Top U.S. Gateways for North American Merchandise Trade by Mode: 1996

(Current value in millions of U.S. dollars)

| Port name                                 | Exports   |           |                      | Imports     |             |                      | Total North American trade |
|---|-----------|-----------|----------------------|-------------|-------------|----------------------|----------------------------|
|   | To Canada | To Mexico | Total North American | From Canada | From Mexico | Total North American |                            |
| <b>Air</b>                                |           |           |                      |             |             |                      |                            |
| Cleveland, OH                             | 3,607     | 236       | 3,843                | 2,983       | 210         | 3,193                | 7,036                      |
| New Orleans, LA                           | 2,193     | 210       | 2,403                | 986         | 198         | 1,183                | 3,586                      |
| Los Angeles International Airport, CA     | 468       | 320       | 788                  | 140         | 324         | 464                  | 1,251                      |
| Newark, NJ                                | 110       | 13        | 123                  | 693         | 14          | 707                  | 830                        |
| Sandusky, OH                              | 811       | 0         | 811                  | 8           | 0           | 8                    | 819                        |
| John F. Kennedy International Airport, NY | 265       | 201       | 466                  | 269         | 78          | 347                  | 813                        |
| Detroit, MI                               | 449       | 2         | 450                  | 262         | 1           | 263                  | 713                        |
| Buffalo-Niagara Falls, NY                 | 651       | 0         | 651                  | 40          | 1           | 41                   | 692                        |
| San Francisco International Airport, CA   | 367       | 54        | 422                  | 201         | 37          | 238                  | 659                        |
| Miami International Airport, FL           | 75        | 298       | 373                  | 22          | 112         | 134                  | 507                        |
| <b>Water Transport</b>                    |           |           |                      |             |             |                      |                            |
| Port of Houston, TX                       | 64        | 929       | 992                  | 104         | 2,128       | 2,232                | 3,225                      |
| Port of Lake Charles, LA                  | 75        | 11        | 86                   | 0           | 887         | 888                  | 973                        |
| Port of Corpus Christie, TX               | 254       | 215       | 469                  | 17          | 486         | 503                  | 973                        |
| Port of New Orleans, LA                   | 47        | 455       | 502                  | 35          | 435         | 470                  | 972                        |
| Port of Baton Rouge, LA                   | 25        | 53        | 78                   | 53          | 314         | 367                  | 446                        |
| Port of New York, NY                      | 80        | 10        | 90                   | 231         | 113         | 344                  | 434                        |
| Port of Mobile, AL                        | 1         | 69        | 70                   | 92          | 224         | 317                  | 386                        |
| Port of Freeport, TX                      | 21        | 2         | 23                   | 12          | 292         | 304                  | 326                        |
| Port of San Juan, PR                      | 0         | 32        | 32                   | 145         | 88          | 233                  | 265                        |
| Port of Charleston, SC                    | 3         | 49        | 51                   | 187         | 16          | 203                  | 255                        |
| <b>Road</b>                               |           |           |                      |             |             |                      |                            |
| Port of Detroit, MI                       | 37,179    | 0         | 37,179               | 30,681      | 0           | 30,681               | 67,859                     |
| Port of Buffalo-Niagara Falls, NY         | 25,634    | 0         | 25,634               | 19,434      | 0           | 19,434               | 45,068                     |
| Port of Laredo, TX                        | 0         | 15,923    | 15,923               | 0           | 12,512      | 12,512               | 28,436                     |
| Port of El Paso, TX                       | 0         | 9,259     | 9,259                | 0           | 11,601      | 11,601               | 20,861                     |
| Port of Port Huron, MI                    | 9,034     | 0         | 9,034                | 11,477      | 0           | 11,477               | 20,511                     |
| Port of Champlain-Rouses Point, NY        | 5,701     | 0         | 5,701                | 7,385       | 0           | 7,385                | 13,086                     |
| Port of Otay Mesa, CA                     | 0         | 4,691     | 4,691                | 0           | 6,975       | 6,975                | 11,666                     |
| Port of Blaine, WA                        | 5,603     | 0         | 5,603                | 6,975       | 0           | 6,975                | 9,363                      |
| Port of Alexandria Bay, NY                | 2,925     | 0         | 2,925                | 4,907       | 0           | 4,907                | 7,832                      |
| Port of Highgate Springs-Alburl, VT       | 2,289     | 0         | 2,289                | 4,757       | 0           | 4,757                | 7,046                      |

**t a b l e** 6-3c

## Top U.S. Gateways for North American Merchandise Trade by Mode: 1996—*Continued*

(Current value in millions of U.S. dollars)

| Port name                              | Exports   |           |                      | Imports     |             |                      | Total North American trade |
|--|-----------|-----------|----------------------|-------------|-------------|----------------------|----------------------------|
|  | To Canada | To Mexico | Total North American | From Canada | From Mexico | Total North American |                            |
| <b>Rail</b>                            |           |           |                      |             |             |                      |                            |
| Port of Detroit, MI                    | 6,560     | 0         | 6,560                | 10,298      | 0           | 10,298               | 16,868                     |
| Port of Buffalo-Niagara Falls, NY      | 5,192     | 0         | 5,192                | 7,374       | 0           | 7,374                | 12,566                     |
| Port of Port Huron, MI                 | 2,021     | 0         | 2,021                | 9,638       | 0           | 9,638                | 11,659                     |
| Port of Laredo, TX                     | 0         | 2,192     | 2,192                | 0           | 8,138       | 8,138                | 10,330                     |
| Port of Eagle Pass, TX                 | 0         | 2,089     | 2,089                | 0           | 1,852       | 1,852                | 3,941                      |
| Port of International Falls-Ranier, MN | 356       | 0         | 356                  | 3,227       | 0           | 3,227                | 3,583                      |
| Port of Portal, ND                     | 367       | 0         | 367                  | 1,122       | 0           | 1,122                | 1,488                      |
| Port of Nogales, AZ                    | 0         | 149       | 149                  | 0           | 1,255       | 1,255                | 1,404                      |
| Port of Trout River, NY                | 1         | 0         | 1                    | 1,320       | 0           | 1,320                | 1,321                      |
| Port of Blaine, WA                     | 248       | 0         | 248                  | 1,045       | 0           | 1,045                | 1,293                      |
| <b>Pipeline</b>                        |           |           |                      |             |             |                      |                            |
| Port of Port Huron, MI                 | 62        | 0         | 62                   | 1,106       | 0           | 1,106                | 1,168                      |
| Port of Ogdensburg, NY                 | 0         | 0         | 0                    | 627         | 0           | 627                  | 627                        |
| Port of Buffalo-Niagara Falls, NY      | 67        | 0         | 67                   | 547         | 0           | 547                  | 614                        |
| Port of Sweetgrass, MT                 | NS        | 0         | NS                   | 535         | 0           | 535                  | 535                        |
| Port of Pembina, ND                    | 0         | 0         | 0                    | 441         | 0           | 441                  | 441                        |
| Port of Piegan, MT                     | 0         | 0         | 0                    | 272         | 0           | 272                  | 272                        |
| Port of Sumas, WA                      | 0         | 0         | 0                    | 209         | 0           | 209                  | 209                        |
| Port of Raymond, MT                    | 0         | 0         | 0                    | 120         | 0           | 120                  | 120                        |
| Port of Detroit, MI                    | 31        | 0         | 0                    | 54          | 0           | 54                   | 85                         |
| Port of International Falls-Ranier, MN | 2         | 0         | 2                    | 32          | 0           | 32                   | 34                         |

**KEY:** NS = Not significant.

### NOTES

Air: Values for some airports may include a low (generally less than 2-3 percent of the total value) level of small user-fee airports located in the same regional area. In addition, due to confidentiality regulations, data for nearby courier operations are included in certain airport totals.

Road, rail and pipeline: Data for individual ports includes transshipments (see Appendix B for definition).

Road, Otay Mesa, CA: Data also include trade by truck that was reported for San Ysidro, CA, and the San Diego Customs District.

### SOURCES

Air: U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. Transportation Branch. Special tabulation. (Washington, DC: 1998).

Water transport: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. *Annual Waterborne Databanks 1996* (formerly TA 305/705). (Washington, DC: 1998).

Road, rail and pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

**t a b l e** 6-4a

## Top Mexican Maritime Intransit Shipment Ports<sup>a</sup>: January-June 1997

(Thousands of U.S. dollars or metric tons)

|  | Value    | Weight      |
|--|----------|-------------|
| <b>To/from the United States</b>   |          |             |
| <b>U.S. overseas exports transshipped through Mexican maritime ports</b>     | <b>N</b> | <b>21.6</b> |
| Port of Manzanillo, Col.   | N        | 15.7        |
| Port of Veracruz, Ver.   | N        | 5.4         |
| Port of Lázaro Cárdenas, Mich.   | N        | 0.3         |
| Port of Progreso, Yuc.   | N        | 0.2         |
| Port of Ensenada, B.C.   | N        | 0.1         |
| <b>U.S. overseas imports transshipped through Mexican maritime ports</b>     | <b>N</b> | <b>92.4</b> |
| Port of Tampico, Tamps.  | N        | 50.6        |
| Port of Tuxpan, Ver.   | N        | 22.9        |
| Port of Veracruz, Ver.   | N        | 10.2        |
| Port of Manzanillo, Col.   | N        | 4.6         |
| Port of Altamira, Tamps.   | N        | 4.2         |
| <b>To/from Canada</b>  |          |             |
| <b>Canadian overseas exports transshipped through Mexican maritime ports</b> | <b>N</b> | <b>0</b>    |
| <b>Canadian overseas imports transshipped through Mexican maritime ports</b> | <b>N</b> | <b>0</b>    |

<sup>a</sup>Ports are ranked on total intransit shipment weight.

**KEY:** N = Data are nonexistent.

**NOTE:** Data are unavailable for 1996.

**SOURCE:** Instituto Mexicano del Transporte. Special tabulation based on 1997 data from the Journal of Commerce. *Port Import Export Reporting Service (PIERS)*. (Querétaro, Qro.: 1998).

**t a b l e 6-4b**

# Top U.S. Maritime Intransit Shipment Ports<sup>a</sup>: 1996

(Thousands of U.S. dollars or metric tons)

|   | Value          | Weight         |
|---|----------------|----------------|
| <b>To/from Canada</b>   |                |                |
| <b>Canadian overseas exports transshipped through U.S. maritime ports</b> | <b>199,519</b> | <b>73.1</b>    |
| Port of Los Angeles, CA   | 119,143        | 30.5           |
| Port of Long Beach, CA  | 70,791         | 38.3           |
| Port of Norfolk, VA   | 4,964          | 2.3            |
| Port of New York, NY  | 1,111          | 0.95           |
| Port of Houston, TX   | 822            | 0.32           |
| <b>Canadian overseas imports transshipped through U.S. maritime ports</b> | <b>442,627</b> | <b>84.3</b>    |
| Port of Superior, WI  | 132,496        | 1.6            |
| Port of Los Angeles, CA   | 83,079         | 11.4           |
| Port of Duluth, MN  | 55,096         | 0.7            |
| Port of Brownsville, TX   | 44,438         | 28.4           |
| Port of Seattle, WA   | 37,781         | 8.3            |
| <b>To/from Mexico</b>   |                |                |
| <b>Mexican overseas exports transshipped through U.S. maritime ports</b>  | <b>420,320</b> | <b>1,111.1</b> |
| Port of Long Beach, CA  | 171,012        | 21.7           |
| Port of Brownsville, TX   | 90,559         | 53.3           |
| Port of Los Angeles, CA   | 46,716         | 13.5           |
| Port of Charleston, SC  | 39,688         | 5.4            |
| Port of Houston, TX   | 21,969         | 4.2            |
| <b>Mexican overseas imports transshipped through U.S. maritime ports</b>  | <b>584,373</b> | <b>1,111.7</b> |
| Port of Los Angeles, CA   | 161,817        | 44.4           |
| Port of Long Beach, CA  | 133,015        | 46.0           |
| Port of Portland, ME  | 126,073        | 889.6          |
| Port Everglades, FL   | 34,136         | 1.9            |
| Port of Miami, FL   | 30,612         | 3.0            |

<sup>a</sup>Ports are ranked on total intransit shipment value.

**SOURCE:** U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. *Annual Waterborne Databanks 1996* (formerly TA 305/705). (Washington, DC: 1998).

**t a b l e** 6-5a

# Top Land Freight Crossing Ports, Canadian-U.S. Border: 1996

(Thousands of truck or train crossings)

| Port name  | Northbound   | Southbound   | Total         |
|--|--------------|--------------|---------------|
| <b>Truck</b>   |              |              |               |
| <b>Canadian-U.S. border, total</b>                                 | <b>5,465</b> | <b>5,405</b> | <b>10,870</b> |
| <b>Detroit, MI/Windsor, Ont.</b>                                   | <b>C</b>     | <b>1,332</b> | <b>U</b>      |
| Ambassador/Windsor Bridge  | C            | N            | N             |
| Windsor-Detroit Tunnel   | 137          | N            | N             |
| <b>Buffalo-Niagara Falls, NY/Fort Erie-Niagara Falls, Ont.</b>     | <b>1,028</b> | <b>996</b>   | <b>2,024</b>  |
| Buffalo, NY/Fort Erie, Ont.  | 601          | N            | N             |
| Niagara Falls, NY/Niagara Falls, Ont.                              | 427          | N            | N             |
| Queenston Bridge   | 419          | N            | N             |
| Rainbow Bridge   | N            | N            | N             |
| Whirlpool Bridge   | 8            | N            | N             |
| <b>Port Huron, MI/Sarnia, Ont.</b>                                 | <b>547</b>   | <b>636</b>   | <b>1,183</b>  |
| <b>Blaine, WA/Douglas and Pacific Highway, B.C.</b>                | <b>392</b>   | <b>402</b>   | <b>794</b>    |
| Blaine, WA/Douglas, B.C.   | N            | N            | N             |
| Blaine, WA/Pacific Highway, B.C.                                   | 392          | N            | N             |
| <b>Champlain-Rouses Pt., NY/Lacolle (Routes 15, 221,223), Que.</b> | <b>313</b>   | <b>279</b>   | <b>592</b>    |
| Champlain, NY/Lacolle Route 15, Que.                               | 305          | N            | N             |
| Rouses Pt., NY/Lacolle Routes 221 and 223, Que.                    | 9            | N            | N             |
| <b>Rail (number of trains)</b>                                     |              |              |               |
| <b>Canadian-U.S. border, total</b>                                 | <b>C</b>     | <b>31</b>    | <b>U</b>      |
| <b>Detroit, MI/Windsor, Ont.</b>                                   | <b>C</b>     | <b>4</b>     | <b>N</b>      |
| Ambassador/Windsor Bridge  | C            | N            | N             |
| Windsor-Detroit Tunnel   | C            | N            | N             |
| <b>Port Huron, MI/Sarnia, Ont.</b>                                 | <b>C</b>     | <b>4</b>     | <b>N</b>      |
| <b>Buffalo-Niagara Falls, NY/Fort Erie-Niagara Falls, Ont.</b>     | <b>C</b>     | <b>4</b>     | <b>N</b>      |
| Buffalo, NY/Fort Erie, Ont.  | C            | N            | N             |
| Niagara Falls, NY/Niagara Falls, Ont.                              | C            | N            | N             |
| Queenston Bridge   | C            | N            | N             |
| Rainbow Bridge   | C            | N            | N             |
| Whirlpool Bridge   | C            | N            | N             |
| <b>International Falls-Rainer, MN/Fort Frances, Ont.</b>           | <b>C</b>     | <b>3</b>     | <b>N</b>      |
| <b>Warroad, MN/Sprague, Man.</b>                                   | <b>C</b>     | <b>3</b>     | <b>N</b>      |

**KEY:** C = Data are confidential. N = Data are nonexistent. U = Data are unavailable.

**NOTES**

Truck: Data represent the number of truck crossings, not the number of unique vehicles.

Rail: Data on the number of rail cars was not available for all ports on the U.S.-Canadian border. The number of trains has been used instead. Table 6-5b does contain data for the number of rail cars on the U.S.-Mexican border.

**SOURCES**

**Northbound**

Statistics Canada. Culture, Tourism and the Center for Education Statistics Division. Special tabulations. (Ottawa, Ont.: 1998).

**Southbound**

U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).

**t a b l e** 6-5b

## Top Land Freight Crossing Ports, Mexican-U.S. Border: 1996

(Thousands of truck or rail car crossings)

| Port name  | Northbound   | Southbound | Total      |
|--|--------------|------------|------------|
| <b>Truck</b>                                     |              |            |            |
| <b>Mexico-U.S. border, total</b>                 | <b>3,235</b> | <b>N</b>   | <b>N</b>   |
| Laredo, TX/Nuevo Laredo, Tamps.                  | 1,016        | 517        | U          |
| El Paso, TX/Ciudad Juárez, Chih.                 | 556          | N          | N          |
| Otay Mesa, CA/Tijuana, B.C.                      | 531          | N          | N          |
| Nogales, AZ/Nogales, Son.                        | 229          | N          | N          |
| Brownsville, TX/Matamoros, Tamps.                | 226          | 198        | 424        |
| <b>Rail (number of full and empty rail cars)</b> |              |            |            |
| <b>Mexico-U.S. border, total</b>                 | <b>286</b>   | <b>201</b> | <b>487</b> |
| Laredo, TX/Nuevo Laredo, Tamps.                  | 116          | 112        | 228        |
| Eagle Pass, TX/Piedras Negras, Coah.             | 62           | 39         | 101        |
| Brownsville, TX/Matamoros, Tamps.                | 51           | 16         | 67         |
| El Paso, TX/Ciudad Juárez, Chih.                 | 22           | 16         | 38         |
| Nogales, AZ/ Nogales, Son.                       | 25           | 6          | 31         |

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

### NOTES

#### North and Southbound

Truck: Data represent the number of truck crossings, not the number of unique vehicles.

#### Northbound

Trucks: Data are for loaded and empty trucks.

Rail: Data include both loaded and unloaded rail cars.

#### Southbound

Laredo, TX/Nuevo Laredo, Tamps., Trucks: Data are for **loaded** trucks only.

Brownsville, TX/Matamoros, Tamps., Trucks: Data are for loaded and empty trucks.

Rail: Data include both loaded and unloaded rail cars.

### SOURCES

#### Northbound

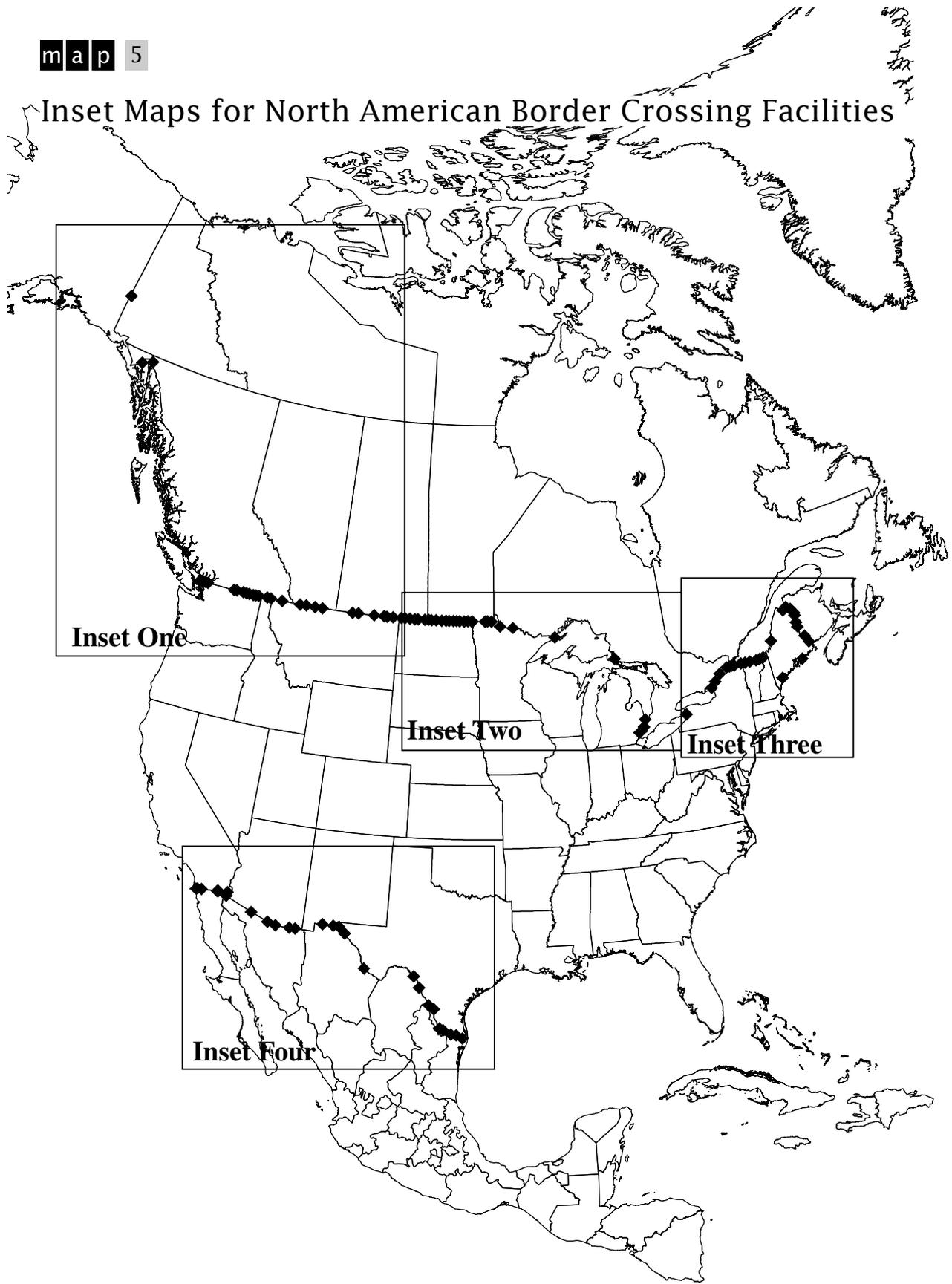
U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).

#### Southbound

Trucks: Data compiled by Texas A&M International University, Texas Center for Border Economic and Enterprise Development based on original data from bridge operators. Web site: [www.tamui.edu/coba/txcntr/](http://www.tamui.edu/coba/txcntr/)

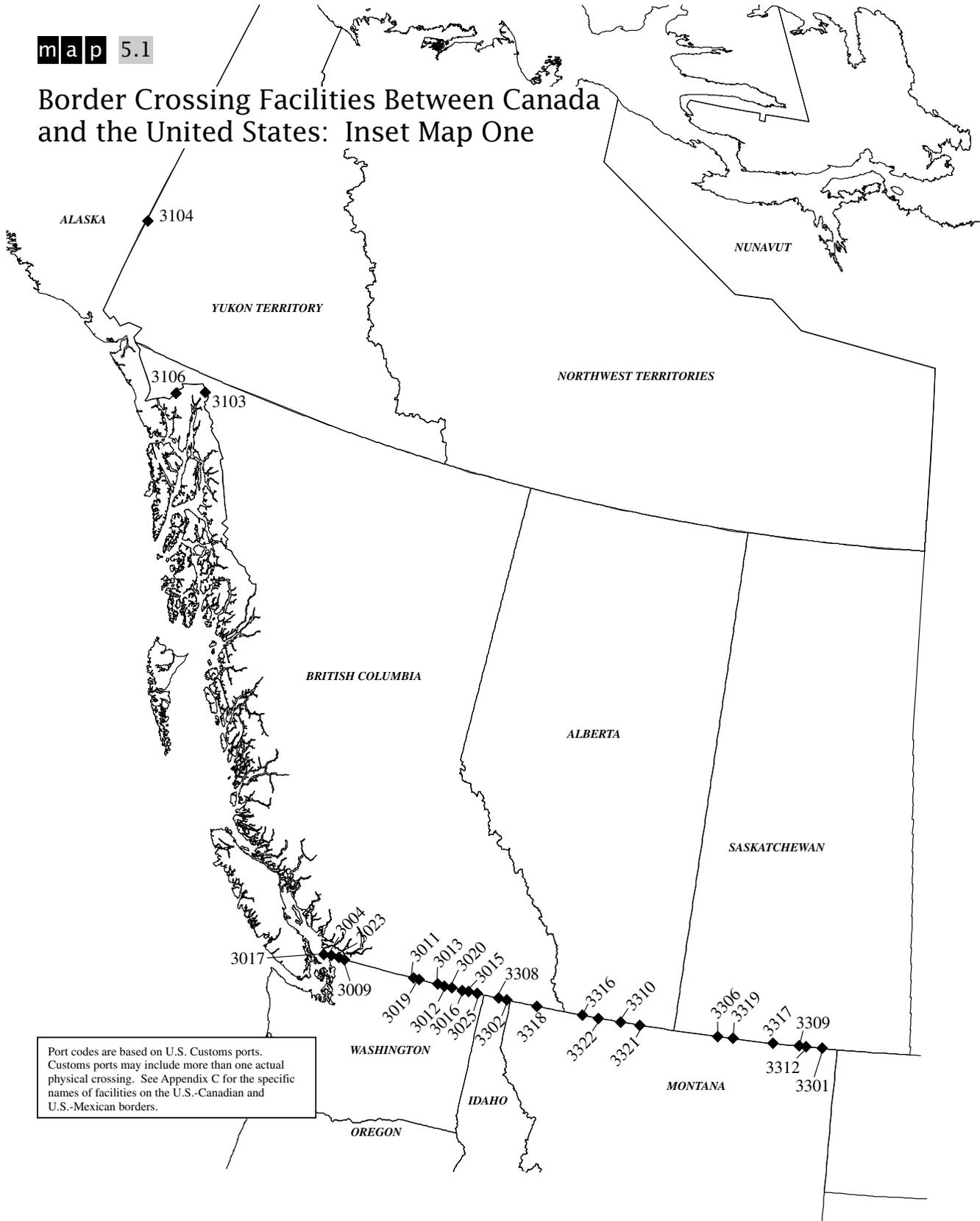
Rail: Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte 1996*. (Querétaro, Qro.: 1998).

# Inset Maps for North American Border Crossing Facilities



map 5.1

# Border Crossing Facilities Between Canada and the United States: Inset Map One



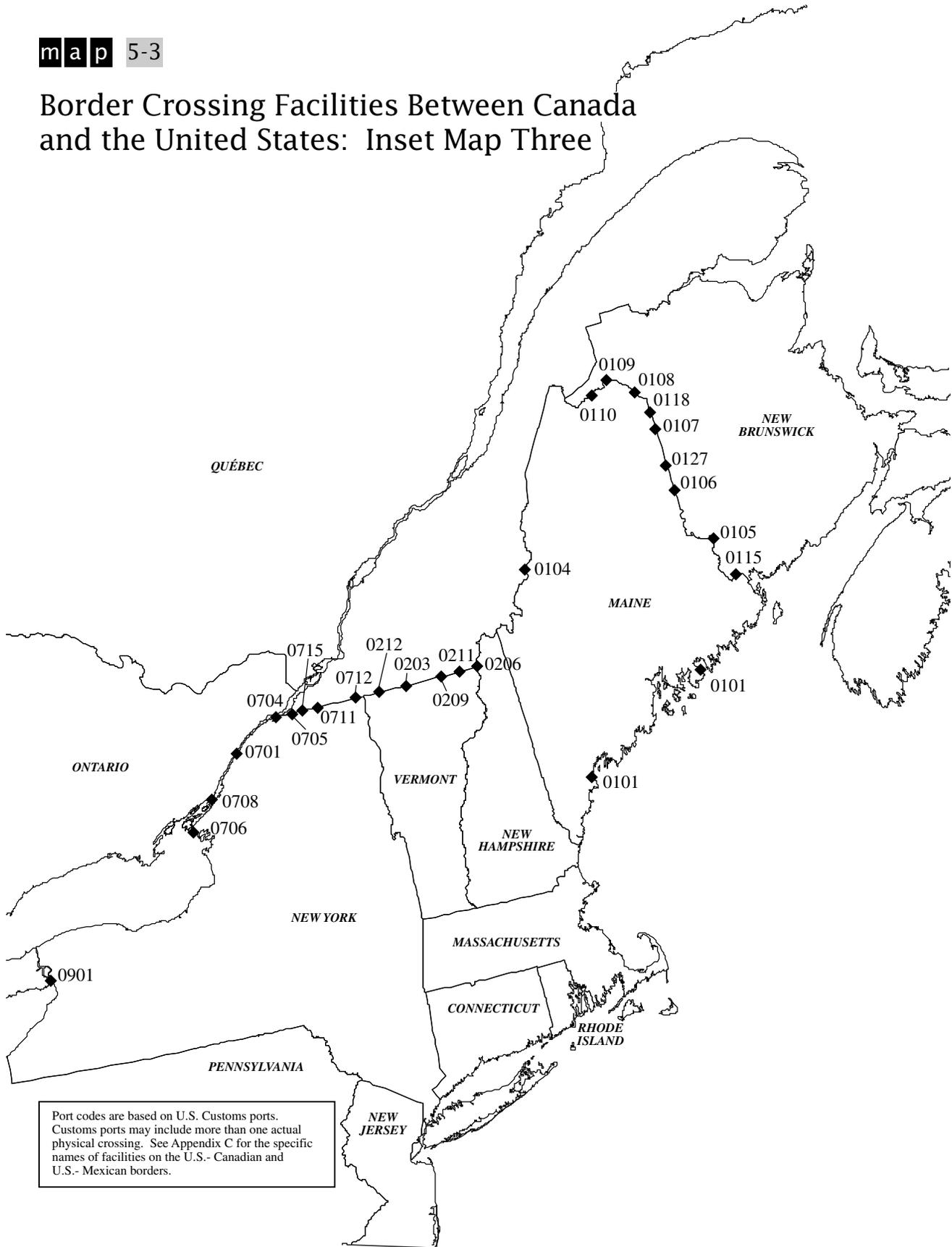
Port codes are based on U.S. Customs ports. Customs ports may include more than one actual physical crossing. See Appendix C for the specific names of facilities on the U.S.-Canadian and U.S.-Mexican borders.

map 5.2

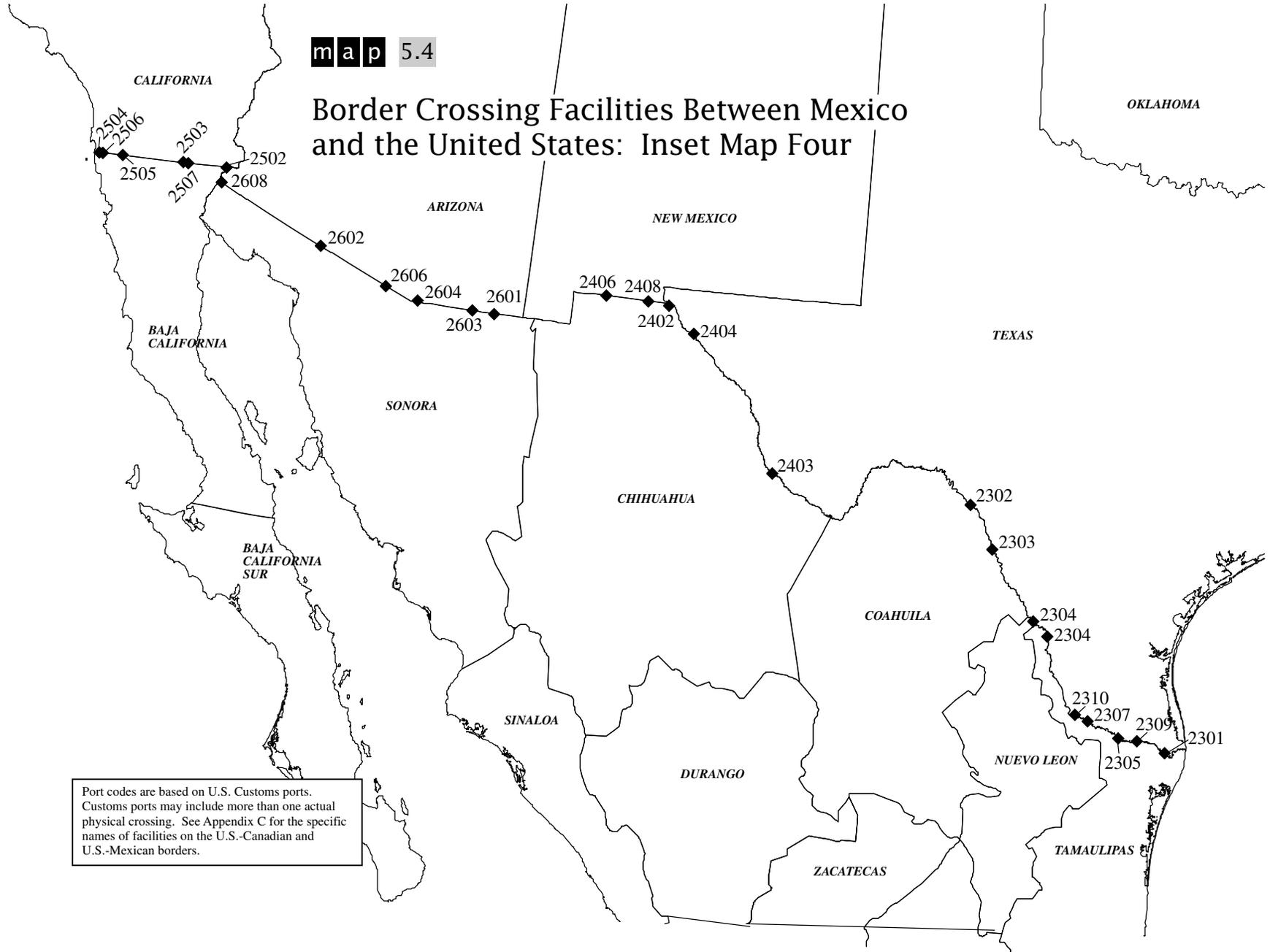
### Border Crossing Facilities Between Canada and the United States: Inset Map Two



## Border Crossing Facilities Between Canada and the United States: Inset Map Three



Port codes are based on U.S. Customs ports. Customs ports may include more than one actual physical crossing. See Appendix C for the specific names of facilities on the U.S.- Canadian and U.S.- Mexican borders.



**t a b l e** 6-6a

## Top Canadian Merchandise Trade Commodities by Mode With Mexico: 1996

(Current value in millions of U.S. dollars)

|   | 1996  |   | 1996 |
|---|-------|---|------|
| <b>Overall exports</b>                              |       | <b>Road imports</b>                                 |      |
| Vehicles other than railway (87)                    | 172   | Electrical machinery, equipment and parts (85)      | 934  |
| Oil seeds and oleaginous fruits (12)                | 143   | Nuclear reactors, boilers, machinery and parts (84) | 589  |
| Nuclear reactors, boilers, machinery and parts (84) | 140   | Vehicles other than railway (87)                    | 493  |
| Cereals (10)  | 108   | Furniture, lamps and prefabricated buildings (94)   | 177  |
| Electrical machinery, equipment and parts (85)      | 70    | Edible vegetables and roots (07)                    | 78   |
| <b>Overall imports</b>                              |       | <b>Rail exports</b>                                 |      |
| Vehicles other than railway (87)                    | 1,482 | Dairy products (04)                                 | 34   |
| Electrical machinery, equipment and parts (85)      | 1,065 | Pulp of wood and paperboard (47)                    | 14   |
| Nuclear reactors, boilers, machinery and parts (84) | 755   | Vehicles other than railway (87)                    | 13   |
| Furniture, lamps and prefabricated buildings (94)   | 180   | Electrical machinery, equipment and parts (85)      | 11   |
| Mineral fuels, oils and waxes (27)                  | 142   | Salt, sulfur, plaster and cement (25)               | 10   |
| <b>Air exports</b>                                  |       | <b>Rail imports</b>                                 |      |
| Nuclear reactors, boilers, machinery and parts (84) | 60    | Vehicles other than railway (87)                    | 986  |
| Electrical machinery, equipment and parts (85)      | 45    | Nuclear reactors, boilers, machinery and parts (84) | 111  |
| Measuring and testing Instruments (90)              | 5     | Electrical machinery, equipment and parts (85)      | 30   |
| Vehicles other than railway (87)                    | 3     | Iron and steel (72)                                 | 16   |
| Pharmaceutical products (30)                        | 2     | Ores, slag and ash (26)                             | 10   |
| <b>Air imports</b>                                  |       | <b>Water exports</b>                                |      |
| Electrical machinery, equipment and parts (85)      | 99    | Oil seeds and oleaginous fruits (12)                | 142  |
| Nuclear reactors, boilers, machinery and parts (84) | 55    | Cereals (10)  | 97   |
| Organic chemicals (29)                              | 53    | Nuclear reactors, boilers, machinery and parts (84) | 27   |
| Measuring and testing instruments (90)              | 8     | Miscellaneous chemical products (38)                | 25   |
| Not knitted or crocheted apparel (62)               | 6     | Salt, sulfur, plaster and cement (25)               | 21   |
| <b>Road exports</b>                                 |       | <b>Water imports</b>                                |      |
| Vehicles other than railway (87)                    | 156   | Mineral fuels, oils and waxes (27)                  | 24   |
| Nuclear reactors, boilers, machinery and parts (84) | 51    | Beverages, spirits and vinegar (22)                 | 8    |
| Impregnated fabrics (59)                            | 16    | Salt, sulfur, plaster and cement (25)               | 7    |
| Electrical machinery, equipment and parts (85)      | 13    | Iron and steel (72)                                 | 3    |
| Rubber and articles (40)                            | 10    | Sugars and sugar confectionery (17)                 | 2    |

**NOTE:** Commodity description based on the two-digit Harmonized Commodity Description and Coding System (HS).

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

## Top Canadian Merchandise Trade Commodities by Mode With the United States: 1996

(Current value in millions of U.S. dollars)

|   | 1996   |   | 1996   |
|---|--------|---|--------|
| <b>Overall exports</b>                              |        | <b>Road imports</b>                                 |        |
| Vehicles other than railway (87)                    | 40,847 | Vehicles other than railway (87)                    | 20,034 |
| Mineral fuels, oils and waxes (27)                  | 19,151 | Nuclear reactors, boilers, machinery and parts (84) | 19,109 |
| Nuclear reactors, boilers, machinery and parts (84) | 15,369 | Electrical machinery, equipment and parts (85)      | 9,829  |
| Electrical machinery, equipment and parts (85)      | 9,274  | Plastics (39)                                       | 3,854  |
| Wood and Articles (44)                              | 8,970  | Special transactions trade (99)                     | 2,484  |
| <b>Overall imports</b>                              |        | <b>Rail exports</b>                                 |        |
| Vehicles other than railway (87)                    | 25,835 | Vehicles other than railway (87)                    | 17,778 |
| Nuclear reactors, boilers, machinery and parts (84) | 22,321 | Wood and articles (44)                              | 4,090  |
| Electrical machinery, equipment and parts (85)      | 13,232 | Paper and paperboard (48)                           | 3,145  |
| Plastics (39)                                       | 4,670  | Pulp of wood and paperboard (47)                    | 1,789  |
| Measuring and testing instruments (90)              | 3,714  | Aluminum and articles (76)                          | 1,290  |
| <b>Air exports</b>                                  |        | <b>Rail imports</b>                                 |        |
| Nuclear reactors, boilers, machinery and parts (84) | 1,973  | Vehicles other than railway (87)                    | 5,700  |
| Electrical machinery, equipment and parts (85)      | 1,481  | Plastics (39)                                       | 747    |
| Aircraft, spacecraft and parts (88)                 | 1,108  | Organic chemicals (29)                              | 622    |
| Special transactions trade (99)                     | 1,047  | Nuclear reactors, boilers, machinery and parts (84) | 352    |
| Pearls, stones, metals and imitation jewelry (71)   | 801    | Miscellaneous chemical products (38)                | 249    |
| <b>Air imports</b>                                  |        | <b>Water exports</b>                                |        |
| Electrical machinery, equipment and parts (85)      | 3,248  | Mineral fuels, oils and waxes (27)                  | 2,402  |
| Nuclear reactors, boilers, machinery and parts (84) | 2,829  | Paper and paperboard (48)                           | 740    |
| Measuring and testing instruments (90)              | 1,246  | Organic chemicals (29)                              | 447    |
| Aircraft, spacecraft and parts (88)                 | 1,206  | Ores, slag and ash (26)                             | 388    |
| Pharmaceutical Products (30)                        | 424    | Salt, sulfur, plaster and cement (25)               | 207    |
| <b>Road exports</b>                                 |        | <b>Water imports</b>                                |        |
| Vehicles other than railway (87)                    | 22,969 | Mineral fuels, oils and waxes (27)                  | 856    |
| Nuclear reactors, boilers, machinery and parts (84) | 12,289 | Ores, slag and ash (26)                             | 285    |
| Electrical machinery, equipment and parts (85)      | 7,740  | Inorganic chemicals (28)                            | 228    |
| Paper and paperboard (48)                           | 4,866  | Electrical machinery, equipment and parts (85)      | 73     |
| Wood and articles (44)                              | 4,691  | Cereals (10)  | 70     |

**NOTE:** Commodity description based on the two-digit Harmonized Commodity Description and Coding System (HS).

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**t a b l e 6-7a**

# Top Mexican Merchandise Trade Commodities by Mode With Canada: 1996

(Current value in millions of U.S. dollars)

|   | 1996  |   | 1996  |
|---|-------|---|-------|
| <b>Overall exports</b>                              |       | <b>Road imports</b>                                 |       |
| Vehicles other than railway (87)                    | 1,056 | Nuclear reactors, boilers, machinery and parts (84) | 190   |
| Nuclear reactors, boilers, machinery and parts (84) | 546   | Electrical machinery, equipment and parts (85)      | 190   |
| Mineral fuels, oils and waxes (27)                  | 138   | Plastics (39)                                       | 58    |
| Electrical machinery, equipment and parts (85)      | 127   | Measuring and testing instruments (90)              | 49    |
| Measuring and testing instruments (90)              | 30    | Vehicles other than railway (87)                    | 42    |
| <b>Overall imports</b>                              |       | <b>Rail exports</b>                                 |       |
| Nuclear reactors, boilers, machinery and parts (84) | 259   | Vehicles other than railway (87)                    | 1,029 |
| Electrical machinery, equipments and parts (85)     | 258   | Nuclear reactors, boilers, machinery and parts (84) | 200   |
| Oil seeds and oleaginous fruits (12)                | 170   | Beverages, spirits and vinegar (22)                 | 9     |
| Vehicles other than railway (87)                    | 155   | Ores, slag and ash (26)                             | 6     |
| Cereals (10)  | 117   | Carpets and other textile floor coverings (57)      | 5     |
| <b>Air exports</b>                                  |       | <b>Rail imports</b>                                 |       |
| Nuclear reactors, boiler, machinery and parts (84)  | 50    | Vehicles other than railway (87)                    | 38    |
| Electrical machinery, equipment and parts (85)      | 23    | Dairy products (4)                                  | 38    |
| Organic chemicals (29)                              | 5     | Pulp of wood and paperboard (47)                    | 23    |
| Not knitted or crocheted apparel (62)               | 4     | Cereals (10)  | 22    |
| Plastics (39)                                       | 3     | Edible vegetables and roots (7)                     | 14    |
| <b>Air imports</b>                                  |       | <b>Water exports</b>                                |       |
| Electrical machinery, equipment and parts (85)      | 54    | Mineral fuels, oils and waxes (27)                  | 138   |
| Nuclear reactors, boilers, machinery and parts (84) | 30    | Vehicles other than railway (87)                    | 8     |
| Special classification provisions (98)              | 19    | Salt, sulfur, plaster and cement (25)               | 9     |
| Measuring and testing instruments (90)              | 9     | Man-made staple fibers (55)                         | 3     |
| Pharmaceutical products (30)                        | 4     | Iron and steel (72)                                 | 3     |
| <b>Road exports</b>                                 |       | <b>Water imports</b>                                |       |
| Nuclear reactors, boilers, machinery and parts (84) | 295   | Oil seeds and oleaginous fruits (12)                | 161   |
| Electrical machinery, equipment and parts (85)      | 95    | Cereals (10)  | 92    |
| Measuring and testing instruments (90)              | 27    | Miscellaneous chemical products (38)                | 24    |
| Edible fruit and nuts (8)                           | 15    | Mineral fuels, oils and waxes (27)                  | 18    |
| Ceramic products (69)                               | 14    | Salt, sulfur, plaster and cement (25)               | 20    |

**NOTE:** Commodity description based on the two-digit Harmonized Commodity Description and Coding System (HS). Mode of transportation data are preliminary.

**SOURCE:** Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**t a b l e 6-7b**

# Top Mexican Merchandise Trade Commodities by Mode With the United States: 1996

(Current value in millions of U.S. dollars)

|   | 1996   |   | 1996   |
|---|--------|---|--------|
| <b>Overall exports</b>                              |        | <b>Road imports</b>                                 |        |
| Electrical machinery, equipment and parts (85)      | 22,959 | Electrical machinery, equipments and parts (85)     | 15,169 |
| Vehicles other than railway (87)                    | 14,034 | Nuclear reactors, boilers, machinery and parts (84) | 6,008  |
| Mineral fuels, oils and waxes (27)                  | 8,929  | Plastics (39)                                       | 4,809  |
| Nuclear reactors, boilers, machinery and parts (84) | 8,629  | Articles of iron and steel (73)                     | 2,098  |
| Not knitted or crocheted apparel (62)               | 2,225  | Special classification provisions (98)              | 738    |
| <b>Overall imports</b>                              |        | <b>Rail exports</b>                                 |        |
| Electrical machinery, equipment and parts (85)      | 16,936 | Vehicles other than railway (87)                    | 10,598 |
| Nuclear reactors, boilers, machinery and parts (84) | 8,683  | Nuclear reactors, boilers, machinery and parts (84) | 704    |
| Plastics (39)                                       | 5,255  | Beverages, spirits and vinegar (22)                 | 238    |
| Articles of iron and steel (73)                     | 2,478  | Inorganic chemicals (28)                            | 131    |
| Special classification provisions (98)              | 898    | Articles of iron and steel (73)                     | 115    |
| <b>Air exports</b>                                  |        | <b>Rail imports</b>                                 |        |
| Electrical machinery, equipments and parts (85)     | 604    | Vehicles other than railway (87)                    | 1,050  |
| Nuclear reactors, boilers, machinery and parts (84) | 563    | Cereals (10)  | 653    |
| Pearls, stones, metals and imitation jewelry (71)   | 214    | Oil seeds and oleaginous fruits (12)                | 643    |
| Aircraft, spacecraft and parts (88)                 | 154    | Pulp of wood and paperboard (47)                    | 289    |
| Measuring and testing instruments (90)              | 138    | Iron and steel (72)                                 | 243    |
| <b>Air imports</b>                                  |        | <b>Water exports</b>                                |        |
| Electrical machinery, equipment and parts (85)      | 790    | Mineral fuels, oils and waxes (27)                  | 8,820  |
| Nuclear reactors, boilers, machinery and parts (84) | 454    | Vehicles other than railway (87)                    | 403    |
| Measuring and testing instruments (90)              | 245    | Organic chemicals (29)                              | 258    |
| Special classification provisions (98)              | 153    | Iron and steel (72)                                 | 172    |
| Pharmaceutical products (30)                        | 65     | Articles of iron and steel (73)                     | 145    |
| <b>Road exports</b>                                 |        | <b>Water imports</b>                                |        |
| Electrical machinery, equipments and parts (85)     | 22,210 | Cereals (10)  | 1,051  |
| Nuclear reactors, boilers, machinery and parts (84) | 7,250  | Mineral fuels, oils and waxes (27)                  | 689    |
| Not knitted or crocheted apparel (62)               | 2,107  | Organic chemicals (29)                              | 485    |
| Furniture, lamps and prefabricated buildings (94)   | 1,562  | Oil seeds and oleaginous fruits (12)                | 272    |
| Edible, vegetables and roots (7)                    | 1,345  | Animal or vegetable fats and oils (15)              | 96     |

**NOTE:** Commodity description based on the two-digit Harmonized Commodity Description and Coding System (HS). Mode of transportation data are preliminary.

**SOURCE:** Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**t a b l e 6-8a**

# Top U.S. Merchandise Trade Commodities by Mode With Canada: 1996

(Current value in millions of U.S. dollars)

|   | 1996   |   | 1996   |
|---|--------|---|--------|
| <b>Overall exports</b>                              |        | <b>Road imports</b>                                 |        |
| Vehicles other than railway (87)                    | 27,205 | Vehicles other than railway (87)                    | 23,115 |
| Nuclear reactors, boilers, machinery and parts (84) | 26,381 | Nuclear reactors, boilers, machinery and parts (84) | 12,957 |
| Electrical machinery, equipment and parts (85)      | 17,840 | Electrical machinery, equipment and parts (85)      | 7,936  |
| Plastics (39)                                       | 5,044  | Special classification provisions (98)              | 5,180  |
| Special classification provisions (98)              | 4,726  | Paper and paperboard (48)                           | 4,762  |
| <b>Overall imports</b>                              |        | <b>Rail exports</b>                                 |        |
| Vehicles other than railway (87)                    | 41,398 | Vehicles other than railway (87)                    | 6,610  |
| Mineral fuels, oils and waxes (27)                  | 16,815 | Nuclear reactors, boilers, machinery and parts (84) | 1,587  |
| Nuclear reactors, boilers, machinery and parts (84) | 14,050 | Plastics (39)                                       | 1,127  |
| Wood and articles (44)                              | 8,596  | Organic chemicals (29)                              | 902    |
| Paper and paperboard (48)                           | 8,491  | Electrical machinery, equipment and parts (85)      | 421    |
| <b>Air exports</b>                                  |        | <b>Rail imports</b>                                 |        |
| Electrical machinery, equipment and parts (85)      | 4,618  | Vehicles other than railway (87)                    | 18,894 |
| Nuclear reactors, boilers, machinery and parts (84) | 3,510  | Wood and articles (44)                              | 3,829  |
| Measuring and testing instruments (90)              | 1,326  | Paper and paperboard (48)                           | 3,099  |
| Aircraft, spacecraft and parts (88)                 | 874    | Nuclear reactors, boilers, machinery and parts (84) | 1,760  |
| Pharmaceutical products (30)                        | 423    | Pulp of wood and paperboard (47)                    | 1,711  |
| <b>Air imports</b>                                  |        | <b>Water exports</b>                                |        |
| Nuclear reactors, boilers, machinery and parts (84) | 1,863  | Mineral fuels, oils and waxes (27)                  | 941    |
| Electrical machinery, equipment and parts (85)      | 1,301  | Ores, slag and ash (26)                             | 298    |
| Special classification provisions (98)              | 1,147  | Inorganic chemicals (28)                            | 251    |
| Pearls, stones, metals and imitation jewelry (71)   | 782    | Electrical machinery, equipment and parts (85)      | 90     |
| Aircraft, spacecraft and parts (88)                 | 514    | Nuclear reactors, boilers, machinery and parts (84) | 73     |
| <b>Road exports</b>                                 |        | <b>Water imports</b>                                |        |
| Nuclear reactors, boilers, machinery and parts (84) | 22,043 | Mineral fuels, oils and waxes (27)                  | 2,046  |
| Vehicles other than railway (87)                    | 20,610 | Paper and paperboard (48)                           | 742    |
| Electrical machinery, equipment and parts (85)      | 12,564 | Organic chemicals (29)                              | 461    |
| Plastics (39)                                       | 3,996  | Ores, slag and ash (26)                             | 378    |
| Special classification provisions (98)              | 3,594  | Salt, sulfur, plaster and cement (25)               | 276    |

**NOTE:** Commodity description based on the two-digit Harmonized Commodity Description and Coding System (HS).

**SOURCES**

Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1996*. (Washington, DC: 1998).

Road and rail: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

**t a b l e** 6-8b

# Top U.S. Merchandise Trade Commodities by Mode With Mexico: 1996

(Current value in millions of U.S. dollars)

|   | 1996   |   | 1996   |
|---|--------|---|--------|
| <b>Overall exports</b>                              |        | <b>Road imports</b>                                 |        |
| Electrical machinery, equipment and parts (85)      | 13,536 | Electrical machinery, equipment and parts (85)      | 17,796 |
| Nuclear reactors, boilers, machinery and parts (84) | 7,416  | Nuclear reactors, boilers, machinery and parts (84) | 6,288  |
| Vehicles other than railway (87)                    | 5,501  | Vehicles other than railway (87)                    | 2,794  |
| Plastics (39)                                       | 3,551  | Not knitted or crocheted apparel (62)               | 2,175  |
| Special classification provisions (98)              | 2,221  | Special classification provisions (98)              | 1,969  |
| <b>Overall imports</b>                              |        | <b>Rail exports</b>                                 |        |
| Electrical machinery, equipment and parts (85)      | 18,702 | Vehicles other than railway (87)                    | 1,671  |
| Vehicles other than railway (87)                    | 14,046 | Cereals (10)  | 503    |
| Nuclear reactors, boilers, machinery and parts (84) | 7,855  | Oil seeds and oleaginous fruits (12)                | 396    |
| Mineral fuels, oils and waxes (27)                  | 6,798  | Nuclear reactors, boilers, machinery and parts (84) | 216    |
| Measuring and testing instruments (90)              | 2,343  | Pulp of wood and paperboard (47)                    | 211    |
| <b>Air exports</b>                                  |        | <b>Rail imports</b>                                 |        |
| Nuclear reactors, boilers, machinery and parts (84) | 848    | Vehicles other than railway (87)                    | 10,408 |
| Electrical machinery, equipment and parts (85)      | 744    | Nuclear reactors, boilers, machinery and parts (84) | 652    |
| Measuring and testing instruments (90)              | 246    | Beverages, spirits and vinegar (22)                 | 247    |
| Pharmaceutical products (30)                        | 56     | Inorganic chemicals (28)                            | 132    |
| Aircraft, spacecraft and parts (88)                 | 52     | Copper and articles (74)                            | 121    |
| <b>Air imports</b>                                  |        | <b>Water exports</b>                                |        |
| Electrical machinery, equipment and parts (85)      | 621    | Cereals (10)  | 1,023  |
| Nuclear reactors, boilers, machinery and parts (84) | 401    | Mineral fuels, oils and waxes (27)                  | 728    |
| Special classification provisions (98)              | 239    | Organic chemicals (29)                              | 436    |
| Pearls, stones, metals and imitation jewelry (71)   | 127    | Oil seeds and oleaginous fruits (12)                | 278    |
| Measuring and testing instruments (90)              | 116    | Nuclear reactors, boilers, machinery and parts (84) | 102    |
| <b>Road exports</b>                                 |        | <b>Water imports</b>                                |        |
| Electrical machinery, equipment and parts (85)      | 12,644 | Mineral fuels, oils and waxes (27)                  | 6,692  |
| Nuclear reactors, boilers, machinery and parts (84) | 6,260  | Vehicles other than railway (87)                    | 806    |
| Vehicles other than railway (87)                    | 3,879  | Iron and steel (72)                                 | 405    |
| Plastics (39)                                       | 3,416  | Organic chemicals (29)                              | 194    |
| Articles of iron and steel (73)                     | 1,568  | Salt, sulfur, plaster and cement (25)               | 108    |

**NOTE:** Commodity description based on the two-digit Harmonized Commodity Description and Coding System (HS).

**SOURCES**

Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1996*. (Washington, DC: 1998).

Road and rail: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

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s e c t i o n 7

International  
Merchandise Trade  
Between North  
America and the  
Rest of the World



**t a b l e** 7-1

## International Merchandise Trade Between North America and the Rest of the World by Value

(Current value in millions of U.S. dollars)

|                              | Canada        |               |               | Mexico   |               |               | United States  |                |                  |
|------------------------------|---------------|---------------|---------------|----------|---------------|---------------|----------------|----------------|------------------|
|                              | 1990          | 1995          | 1996          | 1990     | 1995          | 1996          | 1990           | 1995           | 1996             |
| <b>Total trade</b>           | <b>71,471</b> | <b>89,540</b> | <b>88,699</b> | <b>U</b> | <b>28,493</b> | <b>33,577</b> | <b>655,349</b> | <b>947,377</b> | <b>1,005,328</b> |
| Exports                      | 31,515        | 38,880        | 37,667        | U        | 11,244        | 13,289        | 281,634        | 410,695        | 443,482          |
| Imports                      | 39,956        | 50,660        | 51,032        | U        | 17,249        | 20,288        | 373,715        | 536,682        | 561,846          |
| <b>Air, total trade</b>      | <b>8,986</b>  | <b>16,381</b> | <b>17,436</b> | <b>U</b> | <b>4,095</b>  | <b>5,455</b>  | <b>190,495</b> | <b>335,102</b> | <b>358,960</b>   |
| Exports                      | 5,188         | 5,984         | 6,438         | U        | 1,386         | 1,674         | 103,057        | 168,384        | 181,279          |
| Imports                      | 3,798         | 10,397        | 10,998        | U        | 2,710         | 3,781         | 87,437         | 166,718        | 177,682          |
| <b>Water, total trade</b>    | <b>43,356</b> | <b>56,214</b> | <b>54,081</b> | <b>U</b> | <b>13,919</b> | <b>17,157</b> | <b>415,972</b> | <b>556,041</b> | <b>572,196</b>   |
| Exports                      | 24,429        | 29,098        | 27,749        | U        | 7,524         | 9,463         | 147,361        | 211,825        | 216,042          |
| Imports                      | 18,926        | 27,116        | 26,332        | U        | 6,395         | 7,694         | 268,611        | 344,216        | 356,154          |
| <b>Road, total trade</b>     | <b>9,316</b>  | <b>14,806</b> | <b>14,832</b> | <b>U</b> | <b>7,637</b>  | <b>8,315</b>  | <b>U</b>       | <b>U</b>       | <b>U</b>         |
| Exports                      | 1,802         | 3,436         | 3,163         | U        | 1,883         | 1,832         | U              | U              | U                |
| Imports                      | 7,514         | 11,370        | 11,669        | U        | 5,753         | 6,483         | U              | U              | U                |
| <b>Rail, total trade</b>     | <b>2,375</b>  | <b>1,171</b>  | <b>1,005</b>  | <b>U</b> | <b>680</b>    | <b>685</b>    | <b>U</b>       | <b>U</b>       | <b>U</b>         |
| Exports                      | 93            | 361           | 316           | U        | 257           | 216           | U              | U              | U                |
| Imports                      | 2,281         | 809           | 689           | U        | 423           | 469           | U              | U              | U                |
| <b>Pipeline, total trade</b> | <b>7,438</b>  | <b>968</b>    | <b>1,344</b>  | <b>U</b> | <b>NS</b>     | <b>NS</b>     | <b>U</b>       | <b>U</b>       | <b>U</b>         |
| Exports                      | 3             | NS            | NS            | U        | NS            | NS            | U              | U              | U                |
| Imports                      | 7,435         | 968           | 1,344         | U        | NS            | NS            | U              | U              | U                |
| <b>Other, total trade</b>    | <b>N</b>      | <b>N</b>      | <b>N</b>      | <b>U</b> | <b>2,162</b>  | <b>1,965</b>  | <b>U</b>       | <b>U</b>       | <b>U</b>         |
| Exports                      | N             | N             | N             | U        | 194           | 104           | U              | U              | U                |
| Imports                      | N             | N             | N             | U        | 1,968         | 1,861         | U              | U              | U                |

**KEY:** N = Data are nonexistent. NS = Not significant. U = Data are unavailable.

### NOTES

#### All Countries

Intra-North American trade is excluded from these figures (e.g., Canada's trade with Mexico and the United States is excluded; Mexico's trade with Canada and the United States is excluded, and the United State's trade with Mexico and Canada is excluded).

#### Canada

All land modes: Canada export data for all land modes represent transshipments (e.g. trade shipments between Canada and a third country that were transhipped via the United States). Canadian import data are based on the last mode of transport by which the cargo was transported to the port of clearance in Canada.

Pipeline: Data represent mostly pipeline moves. However, the pipeline total shown here also includes mail, parcel post and other miscellaneous modes of transportation.

#### United States

Total: Includes air and water shipments only.

Road, rail and pipeline: Data for these modes are included in U.S. trade with Canada and U.S. trade with Mexico. Data for these modes are therefore shown in Table 6-3.

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**t a b l e 7-1****International Merchandise Trade Between North America  
and the Rest of the World by Value—Continued****SOURCES****Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**United States**

Air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996*. (Washington, DC: 1998).

**t a b l e** 7-2

## International Merchandise Trade Between North America and the Rest of the World by Weight

(Millions of metric tons)

|  | Canada            |                   |                   | Mexico   |            |             | United States |              |              |
|--|-------------------|-------------------|-------------------|----------|------------|-------------|---------------|--------------|--------------|
|  | 1990 <sup>e</sup> | 1995 <sup>e</sup> | 1996 <sup>e</sup> | 1990     | 1995       | 1996        | 1990          | 1995         | 1996         |
| <b>Total trade</b>                     | <b>239.0</b>      | <b>218.7</b>      | <b>235.7</b>      | <b>U</b> | <b>U</b>   | <b>U</b>    | <b>753.9</b>  | <b>827.0</b> | <b>822.0</b> |
| Exports                                | 179.5             | 153.9             | 171.2             | U        | U          | U           | 339.4         | 368.7        | 348.7        |
| Imports                                | 59.5              | 64.7              | 64.6              | U        | U          | U           | 414.5         | 458.3        | 473.3        |
| <b>Air, total trade</b>                | <b>0.7</b>        | <b>1.8</b>        | <b>1.1</b>        | <b>U</b> | <b>U</b>   | <b>U</b>    | <b>2.9</b>    | <b>4.3</b>   | <b>4.6</b>   |
| Exports                                | 0.2               | 0.5               | 0.3               | U        | U          | U           | 1.3           | 2.0          | 2.2          |
| Imports                                | 0.5               | 1.3               | 0.8               | U        | U          | U           | 1.6           | 2.3          | 2.4          |
| <b>Water, total trade</b>              | <b>219.7</b>      | <b>202.4</b>      | <b>220.2</b>      | <b>U</b> | <b>U</b>   | <b>40.6</b> | <b>751.0</b>  | <b>822.7</b> | <b>817.4</b> |
| Exports                                | 177.9             | 151.4             | 169.1             | U        | U          | 31.3        | 338.1         | 366.7        | 346.5        |
| Imports                                | 41.8              | 51.1              | 51.1              | U        | U          | 9.3         | 412.9         | 456.0        | 470.9        |
| <b>Road, total trade</b>               | <b>5.0</b>        | <b>6.2</b>        | <b>4.5</b>        | <b>U</b> | <b>U</b>   | <b>U</b>    | <b>U</b>      | <b>U</b>     | <b>U</b>     |
| Exports                                | 1.2               | 1.8               | 1.5               | U        | U          | U           | U             | U            | U            |
| Imports                                | 3.8               | 4.3               | 3.0               | U        | U          | U           | U             | U            | U            |
| <b>Rail, total trade</b>               | <b>1.2</b>        | <b>0.8</b>        | <b>0.6</b>        | <b>U</b> | <b>0.2</b> | <b>0.4</b>  | <b>U</b>      | <b>U</b>     | <b>U</b>     |
| Exports                                | 0.2               | 0.3               | 0.2               | U        | 0.2        | 0.4         | U             | U            | U            |
| Imports                                | 1.0               | 0.5               | 0.4               | U        | NS         | NS          | U             | U            | U            |
| <b>Pipeline and other, total trade</b> | <b>12.4</b>       | <b>7.5</b>        | <b>9.2</b>        | <b>N</b> | <b>N</b>   | <b>N</b>    | <b>U</b>      | <b>U</b>     | <b>U</b>     |
| Exports                                | 0.0               | NS                | NS                | N        | N          | N           | U             | U            | U            |
| Imports                                | 12.4              | 7.5               | 9.2               | N        | N          | N           | U             | U            | U            |

**KEY:** e = Data are estimated. N = Data are nonexistent. NS = Not significant. U = Data are unavailable.

### NOTES

#### All Countries

Intra-North American trade is excluded from these figures (e.g., Canada's trade with Mexico and the United States is excluded; Mexico's trade with Canada and the United States is excluded, and the United State's trade with Mexico and Canada is excluded).

#### Canada

All land modes: Canada export data for all land modes represent transshipments (e.g. trade shipments between Canada and a third country that were transshipped via the United States). Canadian import data are based on the last mode of transport by which the cargo was transported to the port of clearance in Canada.

#### Mexico

Total, air and road: Data were not available that excluded trade with Canada and the United States. See Appendix B for available data for Mexican air and road trade with all countries.

Rail: Represents trade with Central American countries. Data were unavailable for 1990 that excluded trade with Canada and the United States. See Appendix B for Mexican rail trade with all countries.

Water: Data were unavailable for 1990 and 1995 that excluded trade with Canada and the United States. See Appendix B for Mexican water trade with all countries.

#### United States

Total: Includes only air and water shipments.

Road, rail and pipeline: Data for these modes are included in U.S. trade with Canada and U.S. trade with Mexico. Data for these modes are therefore shown in Table 6-6.

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**t a b l e 7-2****International Merchandise Trade Between North America  
and the Rest of the World by Weight—Continued****SOURCES****Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**Mexico**

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras, 1989-1995*. (Mexico City, D.F.: 1996).

Water: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Road: Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte, 1997*. (Querétaro, Qro.: 1998).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

**United States**

Air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996*. (Washington, DC: 1998).

**t a b l e** 7-3a

## Top Canadian International Merchandise Trade Gateways by Mode: 1996 (Excluding Trade With the United States and Mexico)

(Current value in millions of U.S. dollars)

| Port name                       | Exports | Imports | Total international<br>(non-North American)<br>trade, 1996 |
|---------------------------------|---------|---------|--|
| <b>Air</b>                      |         |         |  |
| Toronto-Pearson Int. Air, Ont.  | 2,940   | 5,443   | 8,383  |
| Montréal-Mirabel Int. Air, Que. | 1,241   | 2,289   | 3,529  |
| Ottawa, Ont.                    | 591     | 1,384   | 1,975  |
| Montréal-Dorval Int. Air, Que.  | 750     | 394     | 1,143  |
| Vancouver-Int. Airport, B.C.    | 451     | 600     | 1,051  |
| Calgary, Alta.                  | 304     | 371     | 674  |
| Hamilton, Ont.                  | 62      | 365     | 427  |
| Granby, Que.                    | 0       | 248     | 248  |
| Edmonton, Alta.                 | 47      | 109     | 156  |
| Winnipeg, Man.                  | 103     | 1       | 104  |
| <b>Water Transport</b>          |         |         |  |
| Vancouver-Marine and Rail, B.C. | 12,369  | NS      | 12,369   |
| Montréal-Main Long Room, Que.   | 4,378   | 5,695   | 10,073   |
| Toronto-Main Long Room, Ont.    | 69      | 6,014   | 6,083  |
| Halifax, N.S.                   | 2,419   | 2,194   | 4,614  |
| Vancouver-Main Long Room, B.C.  | 0       | 4,353   | 4,353  |
| Nanaimo, B.C.                   | 2,228   | 1       | 2,229  |
| Saint John, N.B.                | 662     | 1,545   | 2,207  |
| Québec, Que.                    | 551     | 1,199   | 1,751  |
| Sept-Îles, Que.                 | 892     | 120     | 1,012  |
| Brampton, Ont.                  | 0       | 887     | 887  |
| <b>Road</b>                     |         |         |  |
| Windsor-Ambassador Bridge, Ont. | 249     | 2,274   | 2,523  |
| Lacolle, Que.                   | 1,287   | 842     | 2,129  |
| Fort Erie, Ont.                 | 520     | 1,225   | 1,745  |
| Niagara Falls, Ont.             | 633     | 971     | 1,604  |
| Phillipsburg, Que.              | 0       | 973     | 973  |
| Pacific Highway, B.C.           | 75      | 797     | 872  |
| Toronto-Q'way Truck Term, Ont.  | 0       | 524     | 524  |
| Sarnia, Ont.                    | 81      | 439     | 520  |
| Lansdowne, Ont.                 | 113     | 200     | 313  |
| Coutts, Alta.                   | 29      | 169     | 198  |
| <b>Rail</b>                     |         |         |  |
| Fort Erie, Ont.                 | 138     | 112     | 250  |
| Toronto-Main Long Room, Ont.    | 0       | 236     | 236  |
| Montréal-Main Long Room, Que.   | 0       | 81      | 81   |
| Sarnia, Ont.                    | 51      | 10      | 61   |
| Windsor-Ambassador Bridge, Ont. | 48      | 1       | 49   |
| Lacolle, Que.                   | 31      | 11      | 43   |
| Winnipeg, Man.                  | 0       | 35      | 35   |
| Welland, Ont.                   | 0       | 34      | 34   |
| Niagara Falls, Ont.             | 29      | 2       | 31   |
| Waneta, B.C.                    | 0       | 21      | 21   |

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**t a b l e** 7-3a

**Top Canadian International Merchandise Trade Gateways  
by Mode: 1996**  
(Excluding Trade With the United States and Mexico)—*Continued*

**NOTES**

Merchandise trade with the United States and Mexico is excluded from this data.

All land modes: Canada export data for all land modes represent transshipments (e.g. trade shipments between Canada and a third country that were transshipped via the United States). Canadian import data are based on the last mode of transport by which the cargo was transported to the port of clearance in Canada.

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**t a b l e** 7-3b

# Top U.S. International Merchandise Trade Gateways by Mode: 1996 (Excluding Trade With the Canada and Mexico)

(Current value in millions of U.S. dollars)

| Port name                                 | Exports | Imports | Total international<br>(non-North American)<br>trade, 1996 |
|---|---------|---------|--|
| <b>Air</b>                                |         |         |  |
| John F. Kennedy International Airport, NY | 38,034  | 41,749  | 79,783   |
| San Francisco International Airport, CA   | 33,402  | 37,002  | 70,404   |
| Los Angeles International Airport, CA     | 31,850  | 28,610  | 60,460   |
| Chicago, IL                               | 17,693  | 14,858  | 32,551   |
| Miami International Airport, FL           | 12,122  | 6,163   | 18,284   |
| Anchorage, AK                             | 3,302   | 10,027  | 13,329   |
| Atlanta, GA                               | 3,925   | 4,236   | 8,160  |
| New Orleans, LA                           | 3,702   | 4,120   | 7,823  |
| Dallas/Fort Worth, TX                     | 3,122   | 3,513   | 6,635  |
| Boston Logan Airport, MA                  | 3,747   | 2,691   | 6,438  |
| <b>Water Transport</b>                    |         |         |  |
| Port of Los Angeles, CA                   | 19,954  | 60,842  | 80,795   |
| Port of Long Beach, CA                    | 14,596  | 55,226  | 69,821   |
| Port of New York, NY and NJ               | 19,907  | 44,411  | 64,319   |
| Port of Houston, TX                       | 18,984  | 14,510  | 33,493   |
| Port of Seattle, WA                       | 9,842   | 21,405  | 31,246   |
| Port of Oakland, CA                       | 10,783  | 15,840  | 26,623   |
| Port of Norfolk, VA                       | 13,471  | 10,847  | 24,318   |
| Port of Charleston, SC                    | 10,398  | 13,418  | 23,816   |
| Port of Baltimore, MD                     | 7,826   | 11,302  | 19,128   |
| Port of New Orleans, LA                   | 9,535   | 8,597   | 18,132   |
| <b>Road</b>                               |         |         |  |
| U   | U       | U       | U  |
| <b>Rail</b>                               |         |         |  |
| U   | U       | U       | U  |

**KEY:** U = Data are unavailable.

**NOTES**

Merchandise trade with Canada and Mexico is excluded from this data.

Air: Values for some airports may include a low (generally less than 2-3 percent of the total value) level of small user-fee airports located in the same regional area. In addition, due to confidentiality regulations, data for nearby individual courier operations are included in certain airport totals.

Road, rail and pipeline: Data for these modes are included in U.S. trade with Canada and U.S. trade with Mexico. Data for these modes are therefore shown in Table 6-7c.

**SOURCES**

Air: U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. Transportation Branch. Special tabulation. (Washington, DC: 1998).

Water transport: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. *Annual Waterborne Databanks 1996* (formerly TA 305/705). (Washington, DC: 1998).

**t a b l e 7-4a**

# Top Canadian International Trade Commodities by Value: 1996

(Excluding Trade With the United States and Mexico)

(Current value in millions of U.S. dollars)

|   | 1996  |   | 1996  |
|---|-------|---|-------|
| <b>Overall exports</b>                              |       | <b>Land exports (road only)</b>                     |       |
| Cereals (10)  | 3,599 | Electrical machinery, equipment and parts (85)      | 538   |
| Nuclear reactors, boilers, machinery and parts (84) | 3,109 | Nuclear reactors, boilers, machinery and parts (84) | 516   |
| Wood and articles (44)                              | 3,058 | Vehicles other than railway (87)                    | 458   |
| Pulp of wood and paperboard (47)                    | 2,820 | Ores, slag and ash (26)                             | 114   |
| Electrical machinery, equipment and parts (85)      | 2,186 | Paper and paperboard (48)                           | 106   |
| <b>Overall imports</b>                              |       | <b>Land imports (road only)</b>                     |       |
| Nuclear reactors, boilers, machinery and parts (84) | 9,009 | Nuclear reactors, boilers, machinery and parts (84) | 3,160 |
| Electrical machinery, equipment and parts (85)      | 7,415 | Electrical machinery, equipment and parts (85)      | 2,559 |
| Mineral fuels, oils and waxes (27)                  | 5,464 | Special classification provisions (98)              | 1,263 |
| Vehicles other than railway (87)                    | 3,307 | Vehicles other than railway (87)                    | 584   |
| Special classification provisions (98)              | 1,873 | Edible fruits and nuts (08)                         | 375   |
| <b>Air exports</b>                                  |       | <b>Water exports</b>                                |       |
| Nuclear reactors, boilers, machinery and parts (84) | 1,597 | Cereals (10)  | 3,588 |
| Electrical machinery, equipment and parts (85)      | 1,365 | Wood and articles (44)                              | 3,029 |
| Aircraft, spacecraft and parts (88)                 | 1,040 | Pulp of wood and paperboard (47)                    | 2,795 |
| Pearls, stones, metals and imitation jewelry (71)   | 817   | Paper and paperboard (48)                           | 2,049 |
| Measuring and testing instruments (90)              | 423   | Mineral fuels, oils and waxes (27)                  | 2,036 |
| <b>Air imports</b>                                  |       | <b>Water imports</b>                                |       |
| Nuclear reactors, boilers, machinery and parts (84) | 3,009 | Mineral fuels, oils and waxes (27)                  | 4,192 |
| Electrical machinery, equipment and parts (85)      | 2,500 | Nuclear reactors, boilers, machinery and parts (84) | 3,235 |
| Measuring and testing instruments (90)              | 723   | Vehicles other than railway (87)                    | 2,597 |
| Aircraft, spacecraft and parts (88)                 | 709   | Electrical machinery, equipment and parts (85)      | 1,743 |
| Organic chemicals (29)                              | 567   | Iron and steel (72)                                 | 962   |

**NOTES**

Merchandise trade with the United States and Mexico is excluded from this data.

Commodity code: Description based on the two-digit Harmonized Commodity Description and Coding System (HS).

All land modes: Canada export data for all land modes represent transshipments (e.g. trade shipments between Canada and a third country that were transshipped via the United States). Canadian import data are based on the last mode of transport by which the cargo was transported to the port of clearance in Canada.

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**t a b l e 7-4b**

# Top Mexican International Trade Commodities by Value: 1996

(Excluding Trade With the United States and Canada)

(Current value in millions of U.S. dollars)

|   | 1996  |   | 1996  |
|---|-------|---|-------|
| <b>Overall exports</b>                              |       | <b>Rail imports</b>                                 |       |
| Locomotives and traffic signals (86)                | 1,651 | Nuclear reactors, boilers, machinery and parts (84) | 142   |
| Photographic goods (37)                             | 1,243 | Electrical machinery, equipments and parts (85)     | 100   |
| Nuclear reactors, boilers, machinery and parts (84) | 753   | Toys, games and sport equipment (95)                | 24    |
| Furniture, lamps and prefabricated buildings (94)   | 655   | Dairy products (4)                                  | 17    |
| Malts, starches and inulin (11)                     | 528   | Wool and animal hair (51)                           | 16    |
| <b>Overall imports</b>                              |       | <b>Road exports</b>                                 |       |
| Electrical machinery, equipments and parts (85)     | 2,636 | Nuclear reactors, boilers, machinery and parts (84) | 255   |
| Nuclear reactors, boilers, machinery and parts (84) | 2,182 | Electrical machinery, equipments and parts (85)     | 159   |
| Special classification provisions (98)              | 971   | Vehicles other than railway (87)                    | 108   |
| Organic chemicals (29)                              | 821   | Toys, games and sport equipment (95)                | 89    |
| Pharmaceutical products (30)                        | 260   | Iron and steel (72)                                 | 65    |
| <b>Air exports</b>                                  |       | <b>Road imports</b>                                 |       |
| Nuclear reactors, boilers, machinery and parts (84) | 611   | Electrical machinery, equipments and parts (85)     | 2,057 |
| Electrical machinery, equipments and parts (85)     | 270   | Nuclear reactors, boilers, machinery and parts (84) | 1,037 |
| Pharmaceutical products (30)                        | 201   | Special classification provisions (98)              | 679   |
| Organic chemical (29)                               | 105   | Measuring and testing instruments (90)              | 248   |
| Pearls, stones, metals and imitation jewelry (71)   | 95    | Iron and steel (72)                                 | 141   |
| <b>Air imports</b>                                  |       | <b>Water exports</b>                                |       |
| Electrical machinery, equipments and parts (85)     | 906   | Mineral fuels, oils and waxes (27)                  | 2,281 |
| Nuclear reactors, boilers, machinery and parts (84) | 692   | Vehicles other than railway (87)                    | 1,061 |
| Organic chemicals (29)                              | 553   | Iron and steel (72)                                 | 651   |
| Special classification provisions (98)              | 393   | Nuclear reactors, boilers, machinery and parts (84) | 340   |
| Pharmaceutical products (30)                        | 260   | Articles of iron and steel (73)                     | 267   |
| <b>Rail exports</b>                                 |       | <b>Water imports</b>                                |       |
| Iron and steel (72)                                 | 35    | Nuclear reactors, boilers, machinery and parts (84) | 1,384 |
| Coffee, tea and spices (9)                          | 31    | Iron and steel (72)                                 | 526   |
| Inorganic chemicals (28)                            | 30    | Organic chemicals (29)                              | 397   |
| Salt, sulfur, plaster and cement (25)               | 16    | Electrical machinery, equipments and parts (85)     | 215   |
| Mineral fuels, oils and waxes (27)                  | 15    | Dairy products (4)                                  | 175   |

**NOTE:** Commodity description based on the two-digit Harmonized Commodity Description and Coding System (HS). Mode of transportation data are preliminary.

**SOURCE:** Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**t a b l e** 7-4c

# Top U.S. International Trade Commodities by Value: 1996

(Excluding Trade With Canada and Mexico)

(Current value in millions of U.S. dollars)

|   | 1996    |   | 1996   |
|---|---------|---|--------|
| <b>Overall exports</b>                              |         | Pearls, stones, metals and imitation jewelry (71)   | 13,498 |
| Nuclear reactors, boilers, machinery and parts (84) | 88,937  | Measuring and testing instruments (90)              | 10,875 |
| Electrical machinery, equipment and parts (85)      | 65,934  | Special classification provisions (98)              | 8,808  |
| Aircraft, spacecraft and parts (88)                 | 30,756  | <b>Land exports</b>                                 |        |
| Measuring and testing instruments (90)              | 24,701  | U   | U      |
| Vehicles other than railway (87)                    | 22,847  | <b>Land imports</b>                                 |        |
| <b>Overall imports</b>                              |         | U   | U      |
| Nuclear reactors, boilers, machinery and parts (84) | 108,192 | <b>Water exports</b>                                |        |
| Electrical machinery, equipment and parts (85)      | 87,511  | Nuclear reactors, boilers, machinery and parts (84) | 30,649 |
| Vehicles other than railway (87)                    | 50,075  | Vehicles other than railway (87)                    | 20,164 |
| Mineral fuels, oils and waxes (27)                  | 49,524  | Cereals (10)  | 14,817 |
| Measuring and testing instruments (90)              | 20,087  | Organic chemicals (29)                              | 10,531 |
| <b>Air exports</b>                                  |         | Electrical machinery, equipment and parts (85)      | 9,897  |
| Nuclear reactors, boilers, machinery and parts (84) | 56,197  | <b>Water imports</b>                                |        |
| Electrical machinery, equipment and parts (85)      | 55,295  | Nuclear reactors, boilers, machinery and parts (84) | 53,221 |
| Measuring and testing instruments (90)              | 21,080  | Vehicles other than railway (87)                    | 48,267 |
| Aircraft, spacecraft and parts (88)                 | 10,273  | Mineral fuels, oils and waxes (27)                  | 45,206 |
| Pearls, stones, metals and imitation jewelry (71)   | 9,973   | Electrical machinery, equipment and parts (85)      | 34,767 |
| <b>Air imports</b>                                  |         | Not knitted or crocheted apparel (62)               | 13,847 |
| Electrical machinery, equipment and parts (85)      | 50,501  |   |        |
| Nuclear reactors, boilers, machinery and parts (84) | 50,491  |   |        |

**KEY:** U = Data are unavailable.

**NOTES**

Merchandise trade with Canada and Mexico is excluded from this data.

Commodity code: Description based on the two-digit Harmonized Commodity Description and Coding System (HS).

Total: Includes air and water shipments, excluding trade with Canada and Mexico.

Land (road and rail): Data for these modes are included in U.S. trade with Canada and U.S. trade with Mexico. Data for these modes are therefore shown in Tables 6-12a and 6-12b.

**SOURCE:** Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996.* (Washington, DC: 1998).

**t a b l e** 7-5a

# Top Canadian International Trade Commodities by Weight: 1996

(Excluding Trade With the United States and Mexico)

(Thousands of metric tons)

|   | 1996   |   | 1996   |
|---|--------|---|--------|
| <b>Overall exports</b>                              |        | <b>Land exports (road only)</b>                     |        |
| Special transactions-trade (99)                     | 60,761 | Ores, slag and ash (26)                             | 299    |
| Mineral fuels, oils and waxes (27)                  | 34,757 | Paper and paperboard (48)                           | 155    |
| Ores, slag and ash (26)                             | 19,603 | Edible vegetables and roots (07)                    | 101    |
| Cereals (10)  | 18,036 | Vehicles other than railway (87)                    | 91     |
| Pulp of wood and paperboard (47)                    | 6,146  | Other made up textile articles (63)                 | 69     |
| <b>Overall imports</b>                              |        | <b>Land imports (road only)</b>                     |        |
| Mineral fuels, oils and waxes (27)                  | 38,355 | Edible fruit and nuts (08)                          | 587    |
| Special transactions-trade (99)                     | 4,074  | Nuclear reactors, boilers, machinery and parts (84) | 336    |
| Ores, slag and ash (26)                             | 3,477  | Special classification provisions (98)              | 258    |
| Inorganic chemicals (28)                            | 2,944  | Iron and steel (72)                                 | 232    |
| Iron and steel (72)                                 | 2,533  | Toys, games and sporting equipment (95)             | 206    |
| <b>Air exports</b>                                  |        | <b>Water exports</b>                                |        |
| Iron and steel (72)                                 | 62     | Special transactions-trade (99)                     | 60,644 |
| Special transactions-trade (99)                     | 58     | Mineral fuels, oils and waxes (27)                  | 34,749 |
| Nuclear reactors, boilers, machinery and parts (84) | 36     | Ores, slag and ash (26)                             | 19,303 |
| Electrical machinery, equipment and parts (85)      | 32     | Cereals (10)  | 18,007 |
| Fish and crustaceans (03)                           | 14     | Pulp of wood and paperboard (47)                    | 6,087  |
| <b>Air imports</b>                                  |        | <b>Water imports</b>                                |        |
| Nuclear reactors, boilers, machinery and parts (84) | 113    | Mineral fuels, oils and waxes (27)                  | 29,044 |
| Special classification provisions (98)              | 106    | Special transaction-trade (99)                      | 4,003  |
| Live trees and plants (06)                          | 103    | Ores, slag and ash (26)                             | 3,284  |
| Electrical machinery, equipment and parts (85)      | 84     | Inorganic chemicals (28)                            | 2,920  |
| Ores, slag and ash (26)                             | 54     | Iron and steel (72)                                 | 2,297  |

**NOTES**

Merchandise trade with the United States and Mexico is excluded from these data.

Commodity code: Description based on the two-digit Harmonized Commodity Description and Coding System (HS).

All land modes: Canada export data for all land modes represent transshipments (e.g. trade shipments between Canada and a third country that were transhipped via the United States). Canadian import data are based on the last mode of transport by which the cargo was transported to the port of clearance in Canada.

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**t a b l e** 7-5b

# Top U.S. International Trade Commodities by Weight: 1996 (Excluding Trade With the Canada and Mexico)

(Thousands of metric tons)

|   | 1996 |  | 1996    |
|---|------|--|---------|
| <b>Overall exports</b>                              |      | Electrical machinery, equipment and parts (85) | 314     |
| Mineral fuels, oils and waxes (27)                  | 114  | Not knitted or crocheted apparel (62)          | 199     |
| Cereals (10)  | 81   | Live trees and plants (6)                      | 182     |
| Oil seeds and oleaginous fruits (12)                | 25   | Knitted or crocheted apparel (61)              | 142     |
| Wood and articles (44)                              | 21   | <b>Land exports</b>                            |         |
| Food residues and waste (23)                        | 14   | U  | U       |
| <b>Overall imports</b>                              |      | <b>Land imports</b>                            |         |
| Mineral fuels, oils and waxes (27)                  | 320  | U  | U       |
| Iron and steel (72)                                 | 23   | <b>Water exports</b>                           |         |
| Ores, slag and ash (26)                             | 23   | Mineral fuels, oils and waxes (27)             | 113,562 |
| Salt, sulfur, plaster and cement (25)               | 20   | Cereals (10)                                   | 80,604  |
| Inorganic chemicals (28)                            | 9    | Oil seeds and oleaginous fruits (12)           | 25,232  |
| <b>Air exports</b>                                  |      | Wood and articles (44)                         | 21,407  |
| Nuclear reactors, boilers, machinery and parts (84) | 497  | Food residues and waste (23)                   | 14,106  |
| Electrical machinery, equipment and parts (85)      | 331  | <b>Water imports</b>                           |         |
| Measuring and testing instruments (90)              | 127  | Mineral fuels, oils and waxes (27)             | 320,343 |
| Vehicles other than railway (87)                    | 80   | Iron and steel (72)                            | 23,433  |
| Plastics (39)                                       | 75   | Ores, slag and ash (26)                        | 22,606  |
| <b>Air imports</b>                                  |      | Salt, sulfur, plaster and cement (25)          | 20,098  |
| Nuclear reactors, boilers, machinery and parts (84) | 435  | Inorganic chemicals (28)                       | 9,254   |

**KEY:** U = Data are unavailable.

**NOTES**

Merchandise trade with Canada and Mexico is excluded from these data.

Commodity code: Description based on the two-digit Harmonized Commodity Description and Coding System (HS).

Total: Includes air and water shipments, excluding trade with Canada and Mexico.

Land (road and rail): Data for these modes are included in U.S. trade with Canada and U.S. trade with Mexico for 1996.

**SOURCE:** Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996.* (Washington, DC: 1998).

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s e c t i o n 8

Domestic Passenger  
Travel



**t a b l e 8-1**

## Domestic Passenger Travel by Mode

(Billions (or thousand millions) of passenger-kilometers)

|                            | Canada          |                         |                 | Mexico           |                  |                        | United States |                   |                        |
|----------------------------|-----------------|-------------------------|-----------------|------------------|------------------|------------------------|---------------|-------------------|------------------------|
|                            | 1990            | 1995                    | 1996            | 1990             | 1995             | 1996                   | 1990          | <sup>r</sup> 1995 | 1996                   |
| <b>Passenger-km, total</b> | <b>N</b>        | <sup>e</sup> <b>523</b> | <b>N</b>        | <b>N</b>         | <b>N</b>         | <b>N</b>               | <b>5,702</b>  | <b>6,647</b>      | <b>6,843</b>           |
| <b>Air</b>                 | <b>N</b>        | <b>N</b>                | <b>N</b>        | <b>10</b>        | <b>14</b>        | <sup>e</sup> <b>13</b> | <b>578</b>    | <b>667</b>        | <b>716</b>             |
| Air carriers               | <sup>r</sup> 25 | <sup>r</sup> 25         | <sup>r</sup> 27 | 10               | 14               | <sup>e</sup> 13        | 557           | 650               | 700                    |
| <b>Road</b>                | <b>N</b>        | <sup>e</sup> <b>497</b> | <b>N</b>        | <b>N</b>         | <b>N</b>         | <b>N</b>               | <b>5,084</b>  | <b>5,938</b>      | <b>6,082</b>           |
| Personal vehicles          | <b>N</b>        | <sup>e</sup> 466        | <b>N</b>        | <b>N</b>         | <b>N</b>         | <b>N</b>               | 4,888         | 5,720             | 5,860                  |
| Passenger cars             | <b>N</b>        | <sup>e</sup> 368        | <b>N</b>        | <b>N</b>         | <b>N</b>         | <b>N</b>               | 3,426         | 3,681             | 3,756                  |
| Motorcycles                | <b>N</b>        | <sup>e</sup> 1          | <b>N</b>        | <b>N</b>         | <b>N</b>         | <b>N</b>               | 19            | 18                | 18                     |
| Light trucks               | <b>N</b>        | <sup>e</sup> 97         | <b>N</b>        | <b>N</b>         | <b>N</b>         | <b>N</b>               | 1,442         | 2,021             | 2,086                  |
| Bus                        | <b>N</b>        | <sup>e</sup> 31         | <b>N</b>        | <b>N</b>         | <b>N</b>         | <b>N</b>               | 195           | 219               | 223                    |
| Charter                    | <b>N</b>        | <sup>e</sup> 3          | <b>N</b>        | <b>N</b>         | <b>N</b>         | <b>N</b>               | <b>N</b>      | <b>N</b>          | <b>N</b>               |
| Intercity                  | <b>N</b>        | <sup>e</sup> 3          | <b>N</b>        | <sup>e</sup> 272 | <sup>e</sup> 383 | <sup>e</sup> 391       | <b>N</b>      | <b>N</b>          | <b>N</b>               |
| Local motor                | <b>N</b>        | <sup>e</sup> 13         | <b>N</b>        | <b>N</b>         | <b>N</b>         | <b>N</b>               | 34            | 30                | <sup>p</sup> 30        |
| School                     | <b>N</b>        | <sup>e</sup> 13         | <b>N</b>        | <b>N</b>         | <b>N</b>         | <b>N</b>               | <b>N</b>      | <b>N</b>          | <b>N</b>               |
| <b>Rail</b>                |                 |                         |                 |                  |                  |                        |               |                   |                        |
| Intercity passenger        | 1               | 2                       | 2               | 5                | 2                | 2                      | 10            | 9                 | 8                      |
| <b>Transit</b>             | <b>N</b>        | <sup>a</sup>            | <b>N</b>        | <b>N</b>         | <b>N</b>         | <b>N</b>               | <b>66</b>     | <b>64</b>         | <sup>p</sup> <b>66</b> |
| Transit rail               | <b>N</b>        | <b>N</b>                | <b>N</b>        | <b>N</b>         | <b>N</b>         | <b>N</b>               | 31            | 32                | <sup>p</sup> 34        |
| <b>Water transport</b>     | <b>N</b>        | <b>N</b>                | <b>N</b>        | <b>0.2</b>       | <b>0.2</b>       | <b>0.2</b>             | <b>N</b>      | <b>N</b>          | <b>N</b>               |

<sup>a</sup>Canadian data for all transit services for 1995 are included in the estimate for local motor bus, under road. The transit rail portion of transit services cannot be broken out.

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

### NOTES

#### All Countries

**Air:** The U.S. total for air represents both air carriers and general aviation. However, only the large certificated air carriers are included. See Appendix B for a more complete explanation. The Mexican air total represents only scheduled air carriers. However, nonscheduled and general aviation represents a very small share of passenger travel in Mexico. Canadian data for total air activity are nonexistent because data for general aviation are not collected.

**Road:** Data do not include passenger travel by commercial freight vehicles.

**Transit and water transport:** For the United States, ferry activity is included in the total for transit. For Mexico, data for overall transit activity are nonexistent because the data are not collected. However, Mexican data for water transport do represent ferry activity. Canadian data for transit overall and ferry activity are nonexistent because the data are not collected.

#### Canada

**Air carriers:** Includes Level I to III Canadian air carriers. For a definition of these, see Appendix B.

#### Mexico

**Air:** Data for general aviation are not included in the air total.

**Intercity bus:** Data refer to intercity buses utilizing Mexico's federal highway system.

#### United States

**Passenger-kilometers, total:** Is not the sum of the subcategories because local motor bus is included in both the road and transit totals. This double counting has been removed from the overall total.

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**t a b l e** 8-1**Domestic Passenger Travel by Mode**—Continued**SOURCES****Canada**

Air carriers: Statistics Canada. *Canadian Civil Aviation, Catalogue No. 51-206-XPB*. (Ottawa, Ont.: various years).

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

Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB*. (Ottawa, Ont.: various years).

**Mexico:**

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

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1997).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1998).

**United States**

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: 1986-1997).

U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation 1996*. Web site: [www.bts.gov](http://www.bts.gov)

Road: U.S. Department of Transportation. Federal Highway Administration. Highway Statistics, *Summary to 1995*. (Washington, DC: 1996).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997).

American Public Transit Association (APTA). *Transit Fact Book*. (Washington, DC: various years).

Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996).

Transit rail: American Public Transit Association. *Transit Fact Book*. (Washington, DC: various years).

**t a b l e** 8-2a

## Top Canadian Domestic Passenger Metropolitan Area Pairs by Mode: 1996

(Thousands of passengers)

| Mode of transportation                        | Total         | Mode of transportation                        | Total         |
|---|---------------|---|---------------|
| <b>Air</b>                                    | <b>12,688</b> | <b>Road</b>                                   | <b>22,376</b> |
| Montréal, Que. and Toronto, Ont.              | 1,257         | Montréal, Que and Québec, Que.                | 2,375         |
| Toronto, Ont. and Vancouver, B.C.             | 822           | Montréal, Que. and Ottawa-Hull, Ont. and Que. | 1,835         |
| Ottawa, Ont. and Toronto, Ont.                | 666           | Toronto, Ont. and St. Catherines, Ont.        | 1,727         |
| Calgary, Alta. and Vancouver, B.C.            | 578           | Kitchener, Ont. and Toronto, Ont.             | 1,537         |
| Calgary, Alta. and Toronto, Ont.              | 463           | Toronto, Ont. and London, Ont.                | 1,185         |
| <b>Intercity rail</b>                         | <b>384</b>    | <b>Water</b>                                  | <b>163</b>    |
| Toronto, Ont. and Montréal, Que.              | 106           | Vancouver, B.C. and Victoria, B.C.            | 141           |
| Toronto, Ont. and Ottawa-Hull, Ont. and Que.  | 71            | Vancouver, B.C. and Vancouver, B.C.           | 12            |
| London, Ont. and Toronto, Ont.                | 41            |   |               |
| Montréal, Que. and Ottawa-Hull, Ont. and Que. | 35            |   |               |
| Québec, Que. and Montréal, Que.               | 26            |   |               |

**NOTE:** Water data for additional Census metropolitan regions for the water mode have not been included due to the high coefficient of variation (CV) ratings, from the low number of observations.

### SOURCES

Air: Statistics Canada. *Air Passenger Origin and Destination, Domestic Report - 1996, Catalogue No. 51-204-XPB.* (Ottawa, Ont.: 1997).

All other modes: Statistics Canada. *Micro Data Files relating to the Canadian Travel Survey (CTS) - 1996, Catalogue No. 87MOO6XCB.* (Ottawa, Ont.: 1998).

**t a b l e** 8-2b

## Top Mexican Domestic Passenger Metropolitan Area Pairs by Mode: 1996

(Thousands of passengers)

| Mode of transportation                  | Total    | Mode of transportation                     | Total    |
|---|----------|--|----------|
| <b>Air</b>                              |          | <b>Road</b>                                | <b>N</b> |
| Mexico City, D.F. and Monterrey, N.L.   | 1,287    | <b>Water</b>                               |          |
| Mexico City, D.F. and Guadalajara, Jal. | 1,080    | Isla Mujeres, Q. Roo and Punta Sam, Q. Roo | 79       |
| Mexico City, D.F. and Cancún, Q. Roo    | 850      | Mazatlán, Sin. and La Paz, B.C.S.          | 78       |
| Mexico City, D.F. and Tijuana, B.C.     | 650      | La Paz, B.C.S. and Topolobampo, Sin.       | 63       |
| Mexico City, D.F. and Acapulco, Gro.    | 610      | Guaymas, Son. and Santa Rosalía, B.C.S.    | 24       |
| <b>Intercity rail</b>                   | <b>N</b> | Puerto Morelos, Q. Roo and Cozumel, Q. Roo | 17       |

**KEY:** N = Data are nonexistent.

**NOTE:** Water data represent port pairs rather than metropolitan area pairs and are based on ferry traffic. See Appendix B for rail and road data.

### SOURCES

Air: Instituto Mexicano del Transporte based on data from Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Querétaro, Qro.: 1998).

Water: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1998).

map 6

# Top Canadian Domestic Passenger Metropolitan Area Pairs by Mode: 1996



**m a p** 7

**Top Mexican Domestic Passenger Metropolitan Area Pairs by Mode: 1996**



Notes and sources: See Table 8-2b.

**t a b l e** 8-2c

## Top U.S. Domestic Passenger Metropolitan Area Pairs by Mode: 1995

(Thousands of passengers)

| Mode of transportation                | Total          | Mode of transportation               | Total          |
|---------------------------------------|----------------|--------------------------------------|----------------|
| <b>Air</b>                            | <b>161,165</b> | New York, NY and Philadelphia, PA    | 158            |
| Los Angeles, CA and San Francisco, CA | 4,009          | Los Angeles and San Francisco, CA    | 132            |
| San Diego, CA and San Francisco, CA   | 1,411          |                                      |                |
| Los Angeles, CA and Phoenix, AZ       | 1,354          | <b>Road</b>                          | <b>834,303</b> |
| Miami, FL and New York, NY            | 1,326          | Los Angeles, CA and San Diego, CA    | 10,178         |
| Las Vegas, NV and Los Angeles, CA     | 1,276          | New York, NY and Philadelphia, PA    | 8,267          |
| <b>Intercity rail</b>                 | <b>4,994</b>   | Las Vegas, NV and Los Angeles, CA    | 7,844          |
| New York, NY and Washington, DC       | 547            | New York, NY and Washington, DC      | 6,603          |
| San Diego, CA and Los Angeles, CA     | 212            | Sacramento, CA and San Francisco, CA | 5,272          |
| Boston, MA and Washington, DC         | 169            | <b>Water Transport</b>               | <b>U</b>       |

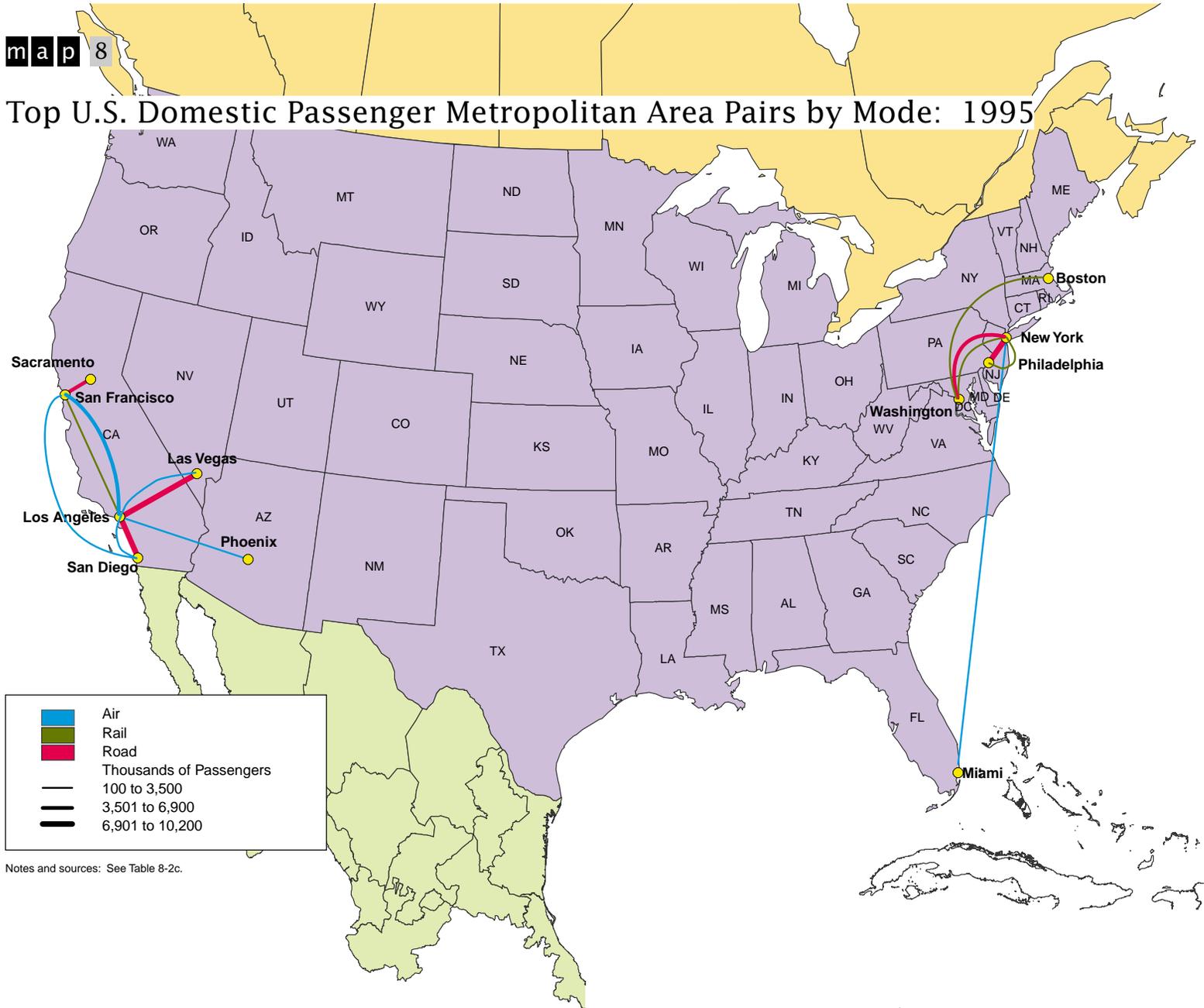
**KEY:** U = Data are unavailable.

**NOTES:** Data are based on trips over 100 miles one-way. Hence, trips between cities less than 100 miles apart are not included. Places are defined at the highest aggregation of metropolitan geography, either consolidated metropolitan statistical areas (CMSAs) or metropolitan statistical areas (MSAs).

**SOURCE:** U.S. Department of Transportation. Bureau of Transportation Statistics. *1995 American Travel Survey*. Special tabulation. (Washington, DC: 1996).

map 8

# Top U.S. Domestic Passenger Metropolitan Area Pairs by Mode: 1995





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s e c t i o n 9

North American  
Passenger Travel



**t a b l e** Table 9-1a

## Canada-Mexico/Mexico-Canada Travel by Mode of Transportation

(Thousands of visitors)

|  | 1990 | 1995 | 1996 |
|--|------|------|------|
| <b>Canadian source data</b>                  |      |      |      |
| Canadian resident overnight travel to Mexico | 433  | 406  | 438  |
| Air  | N    | N    | N    |
| Land   | N    | N    | N    |
| Mexican resident overnight travel to Canada  | 64   | 63   | 81   |
| Air  | N    | N    | N    |
| Land   | N    | N    | N    |
| <b>Mexican source data</b>                   |      |      |      |
| Canadian resident overnight travel to Mexico | 294  | 198  | 269  |
| Air  | 268  | 167  | 233  |
| Land   | 26   | 29   | 35   |
| Mexican resident overnight travel to Canada  | N    | N    | N    |
| Air  | 17   | 14   | 17   |
| Land   | N    | N    | N    |

**KEY:** N = Data are nonexistent.**NOTE:** For information on Canada's and Mexico's travel surveys and definitions of specific types of international visitors and which of these visitors are included in the specific categories shown in Table 9-1a, see Appendix B.**SOURCES****Canada**Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope)*, Catalogue No. 66-201-XPB. (Ottawa, Ont.: various years).**Mexico**

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

**t a b l e** 9-1b

## Canada-United States/United States-Canada Travel by Mode of Transportation

(Thousands of visitors)

|  | 1990          | 1995          | 1996          |
|--|---------------|---------------|---------------|
| <b>Canadian source data</b>                                    |               |               |               |
| <b>Canadian resident overnight travel to the United States</b> | <b>17,262</b> | <b>14,663</b> | <b>15,301</b> |
| Air  | 4,039         | 3,802         | 4,496         |
| Land   |               |               |               |
| Motor vehicles   | 12,770        | 10,338        | 10,251        |
| Personal vehicles  | 12,164        | 9,686         | 9,579         |
| Intercity and charter buses                                    | 606           | 652           | 672           |
| Intercity rail   | 36            | 34            | 33            |
| Pedestrians  | N             | N             | N             |
| Other <sup>a</sup>   | 416           | 489           | 521           |
| <b>Canadian resident same day travel to the United States</b>  | <b>53,171</b> | <b>37,491</b> | <b>37,398</b> |
| Air  | 137           | 138           | 124           |
| Land   |               |               |               |
| Motor vehicles   | 52,629        | 37,201        | 37,159        |
| Personal vehicles  | 51,829        | 36,414        | 36,267        |
| Intercity and charter buses                                    | 800           | 787           | 892           |
| Intercity rail   | N             | N             | N             |
| Pedestrians  | N             | N             | N             |
| Other <sup>a</sup>   | 405           | 152           | 115           |
| <b>U.S. resident overnight travel to Canada</b>                | <b>12,252</b> | <b>13,005</b> | <b>12,909</b> |
| Air  | 2,372         | 2,769         | 3,047         |
| Land   |               |               |               |
| Motor vehicles   | 9,103         | 9,451         | 9,097         |
| Personal vehicles  | 8,381         | 8,702         | 8,325         |
| Intercity and charter buses                                    | 722           | 749           | 772           |
| Intercity rail   | N             | 72            | 72            |
| Pedestrians  | N             | N             | N             |
| Other <sup>a</sup>   | 778           | 713           | 692           |
| <b>U.S. resident same day travel to Canada</b>                 | <b>22,482</b> | <b>24,325</b> | <b>25,563</b> |
| Air  | 165           | 260           | 365           |
| Land   |               |               |               |
| Motor vehicles   | 21,412        | 23,604        | 24,700        |
| Personal vehicles  | 20,692        | 22,746        | 23,804        |
| Intercity and charter buses                                    | 720           | 858           | 896           |
| Intercity rail   | N             | 6             | 6             |
| Pedestrians  | N             | N             | N             |
| Other <sup>a</sup>   | 905           | 455           | 492           |

<sup>a</sup>Other includes boat, pedestrians and cyclists.

**KEY:** N = Data are nonexistent.

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**t a b l e** 9-1b

**Canada-United States/United States-Canada Travel  
by Mode of Transportation—Continued**

**SOURCES**

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope)*, Catalogue No. 66-201-XPB. (Ottawa, Ont.: various years).

**United States:** The United States does not collect data on same day travel to or from the United States nor for Canadian resident overnight travel to the United States by all modes of transportation. U.S. agencies typically obtain this data from Statistics Canada. Although not used for the purposes of this table, the Bureau of Transportation Statistics' American Travel Survey provides mode of transportation data on U.S. resident travel to Canada for trips longer than 100 miles (approximately 160 kilometers). (See Appendix B for more information.)

**t a b l e** 9-1c

## Mexico-United States/United States-Mexico Travel by Mode of Transportation

(Thousands of visitors)

|   | 1990          | 1995          | 1996          |
|---|---------------|---------------|---------------|
| <b>Mexican source data</b>                                    |               |               |               |
| <b>Mexican resident overnight travel to the United States</b> | <b>7,040</b>  | <b>8,189</b>  | <b>8,709</b>  |
| Air   | 959           | 796           | 983           |
| Land  | 6,081         | 7,393         | 7,726         |
| Motor vehicles  | N             | N             | N             |
| Personal vehicles   | N             | N             | N             |
| Intercity and charter buses                                   | N             | N             | N             |
| Intercity rail  | NA            | NA            | NA            |
| Pedestrians   | N             | N             | N             |
| Other   | N             | N             | N             |
| <b>Mexican resident same day travel to the United States</b>  | <b>91,494</b> | <b>94,710</b> | <b>94,399</b> |
| Air   | N             | N             | N             |
| Land  | 91,494        | 94,710        | 94,399        |
| Motor vehicles  | U             | U             | U             |
| Personal vehicles   | N             | N             | N             |
| Intercity and charter buses                                   | N             | N             | N             |
| Intercity rail  | NA            | NA            | NA            |
| Pedestrians   | U             | U             | U             |
| Other   | N             | N             | N             |
| <b>U.S. resident overnight travel to Mexico</b>               | <b>16,377</b> | <b>19,221</b> | <b>20,302</b> |
| Air   | 3,635         | 4,741         | 5,361         |
| Land  | 12,742        | 14,480        | 14,941        |
| Motor vehicles  | N             | N             | N             |
| Personal vehicles   | N             | N             | N             |
| Intercity and charter buses                                   | N             | N             | N             |
| Intercity rail  | NA            | NA            | NA            |
| Pedestrians   | N             | N             | N             |
| Other   | N             | N             | N             |
| <b>U.S. resident same day travel to Mexico</b>                | <b>64,038</b> | <b>63,508</b> | <b>66,859</b> |
| Air   | N             | N             | N             |
| Land  | 64,038        | 63,508        | 66,859        |
| Motor vehicles  | U             | U             | U             |
| Personal vehicles   | N             | N             | N             |
| Intercity and charter buses                                   | N             | N             | N             |
| Intercity rail  | NA            | NA            | NA            |
| Pedestrians   | U             | U             | U             |
| Other   | N             | N             | N             |

**KEY:** NA = Not applicable. N = Data are nonexistent. U = Data are unavailable.

**NOTE:** For information on Mexico's travel surveys and definitions of specific types of international visitors and which of these visitors are included in the categories shown in Table 9-1c, see Appendix B.

Mexican resident same day travel to the United States and U.S. resident same day travel to Mexico: Totals do not include same day travel by air.

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**t a b l e** 9-1c**Mexico-United States/United States-Mexico Travel  
by Mode of Transportation—Continued****SOURCES****Mexico**

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

**United States**

The United States does not collect data on same day travel to or from the United States nor for Mexican resident overnight travel to the United States for all modes of transportation. Although not used for the purposes of this table, the Bureau of Transportation Statistics' American Travel Survey provides mode of transportation data on U.S. resident travel to Mexico for trips longer than 100 miles (approximately 160 kilometers). (See Appendix B for more information.)

**figure** 9-1a

### Percent Share of Total Travel Between Canada and Mexico: 1996

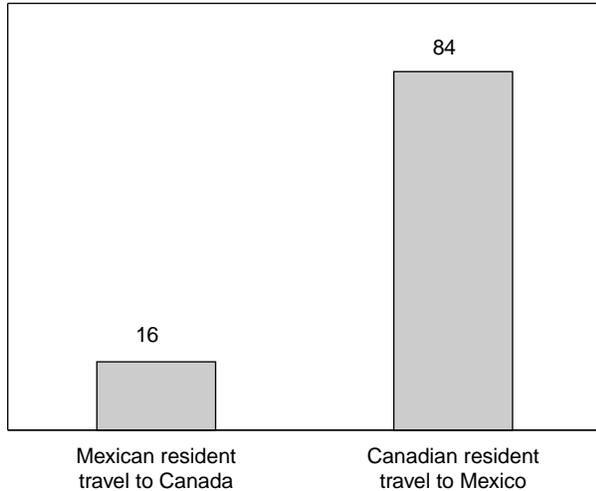
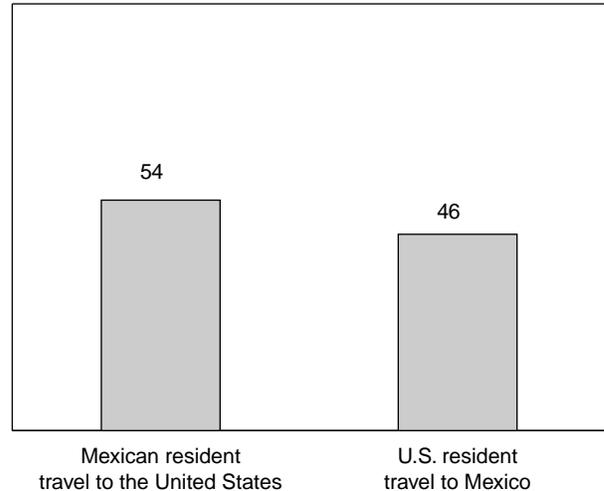


Figure 9-1a is based on Canadian data. Travel between Canada and Mexico only includes overnight travel.  
Notes and sources: See Table 9-1a.

**figure** 9-1c

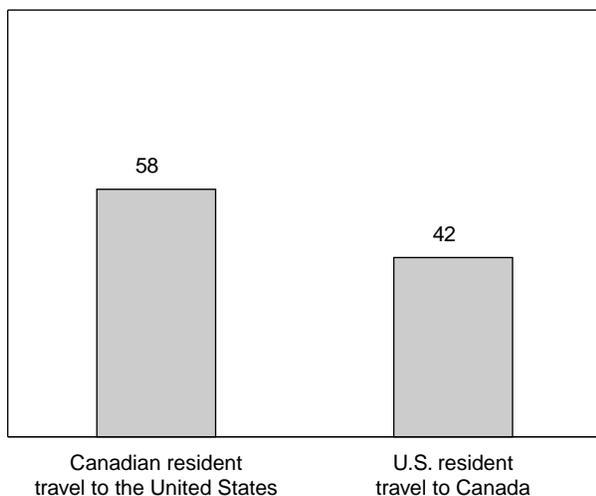
### Percent Share of Total Travel Between Mexico and the United States: 1996



Notes and sources: See Table 9-1c.

**figure** 9-1b

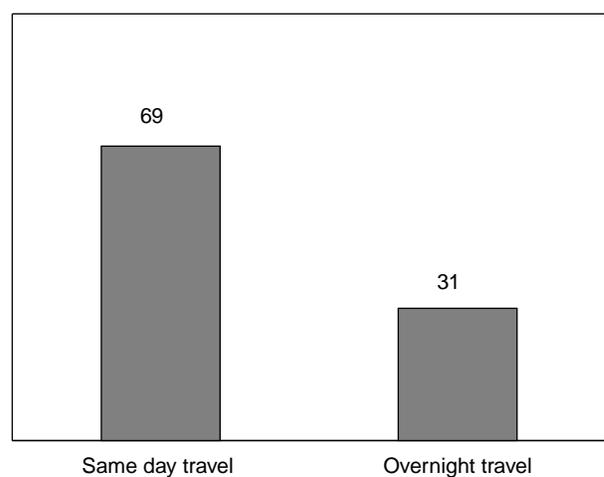
### Percent Share of Total Travel Between Canada and the United States: 1996



Notes and sources: See Table 9-1b.

**figure** 9-1d

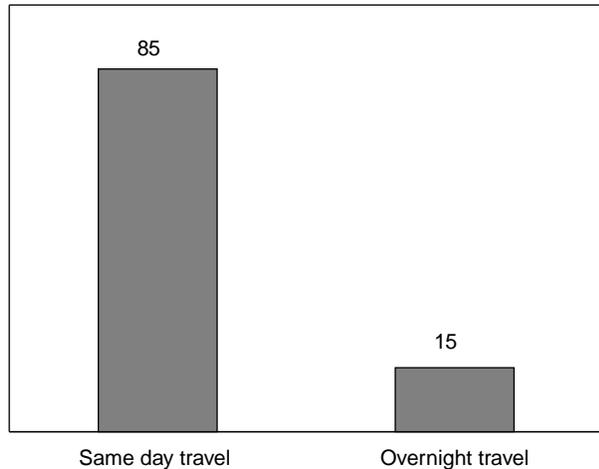
### Same Day vs. Overnight Travel, Percent Share of Total Travel Between Canada and the United States: 1996



Notes and sources: See Table 9-1b.

**figure** 9-1e

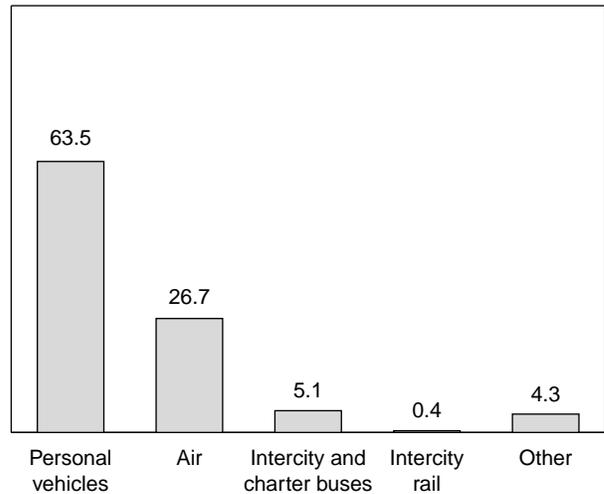
### Same Day vs. Overnight Travel, Percent Share of Total Travel Between Mexico and the United States: 1996



Notes and sources: See Table 9-1c.

**figure** 9-1g

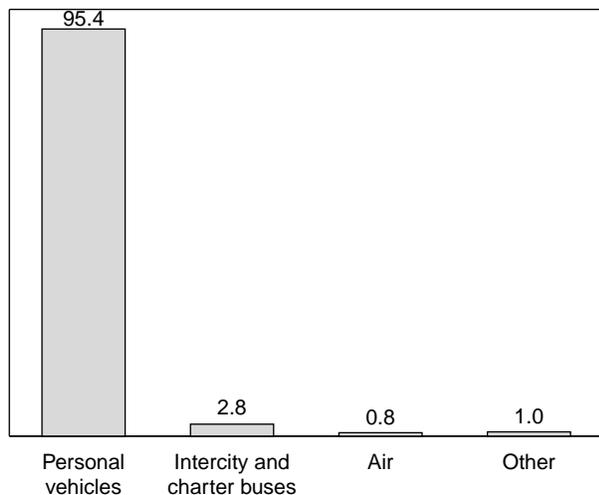
### Percent Modal Share of Canadian - U.S. Overnight Passenger Travel: 1996



Other modes include boat, pedestrians, and cyclists.  
Notes and sources: See Table 9-1b.

**figure** 9-1f

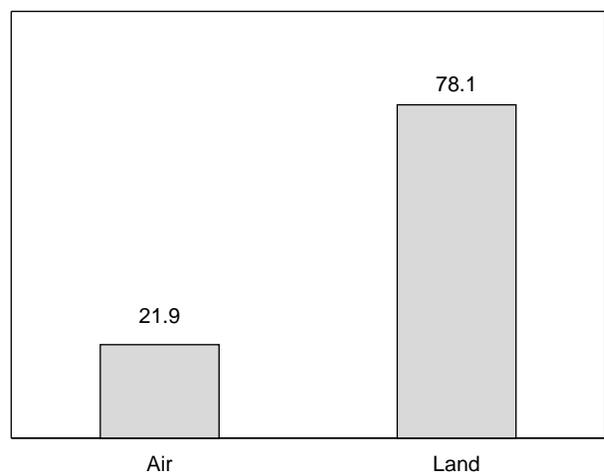
### Percent Modal Share of Canadian - U.S. Same Day Passenger Travel: 1996



Data for intercity rail are not available. Other modes include boat, pedestrians, and cyclists.  
Notes and sources: See Table 9-1b.

**figure** 9-1h

### Percent Modal Share of Mexican - U.S. Overnight Passenger Travel: 1996



Additional modal detail is unavailable.  
Notes and sources: See Table 9-1c.

**t a b l e** 9-2a

# Top Land Passenger Ports, Canadian-U.S. Border: 1996

(Thousands of vehicles or passengers/pedestrians)

| Port name   | Northbound    | Southbound     | Total          |
|---|---------------|----------------|----------------|
| <b>Personal vehicles</b>                                    |               |                |                |
| <b>Canadian-U.S. border, total</b>                          | <b>38,858</b> | <b>39,537</b>  | <b>78,394</b>  |
| Detroit, MI/Windsor, Ont.                                   | C             | 8,324          | N              |
| Ambassador/Windsor Bridge                                   | C             | N              | N              |
| Windsor-Detroit Tunnel                                      | 4,311         | N              | N              |
| Buffalo-Niagara Falls, NY/Fort Erie-Niagara Falls, Ont.     | 7,273         | 7,574          | 14,847         |
| Buffalo, NY/Fort Erie, Ont.                                 | 3,190         | N              | N              |
| Niagara Falls, NY/Niagara Falls, Ont.                       | 4,083         | N              | N              |
| Queenston Bridge  | 1,860         | N              | N              |
| Rainbow Bridge  | 1,597         | N              | N              |
| Whirlpool Bridge  | 626           | N              | N              |
| Blaine, WA/Douglas and Pacific Highway, B.C.                | 4,056         | 4,667          | 8,723          |
| Blaine, WA/Douglas, B.C.                                    | 2,293         | N              | N              |
| Blaine, WA/Pacific Highway, B.C.                            | 1,763         | N              | N              |
| Port Huron, MI/Sarnia, Ont.                                 | 1,920         | 2,075          | 3,995          |
| Sault Ste. Marie, MI/Sault Ste. Marie, Ont.                 | 1,414         | 1,617          | 3,031          |
| <b>Passengers in personal vehicles</b>                      |               |                |                |
| <b>Canadian-U.S. border, total</b>                          | <b>77,975</b> | <b>100,444</b> | <b>178,419</b> |
| Detroit, MI/Windsor, Ont.                                   | C             | 23,511         | N              |
| Ambassador/Windsor Bridge                                   | C             | N              | N              |
| Windsor-Detroit Tunnel                                      | 8,238         | N              | N              |
| Buffalo-Niagara Falls, NY/Fort Erie-Niagara Falls, Ont.     | 15,279        | 16,517         | 31,796         |
| Buffalo, NY/Fort Erie, Ont.                                 | 6,242         | N              | N              |
| Niagara Falls, NY/Niagara Falls, Ont.                       | 9,037         | N              | N              |
| Queenston Bridge  | 4,078         | N              | N              |
| Rainbow Bridge  | 3,765         | N              | N              |
| Whirlpool Bridge  | 1,194         | N              | N              |
| Blaine, WA/Douglas and Pacific Highway, B.C.                | 7,761         | 11,387         | 19,148         |
| Blaine, WA/Douglas, B.C.                                    | 4,357         | N              | N              |
| Blaine, WA/Pacific Highway, B.C.                            | 3,404         | N              | N              |
| Port Huron, MI/Sarnia, Ont.                                 | 3,984         | 5,392          | 9,375          |
| Sault Ste. Marie, MI/Sault Ste. Marie, Ont.                 | 2,854         | 5,325          | 8,179          |
| <b>Buses<sup>a</sup></b>                                    |               |                |                |
| <b>Canadian-U.S. border, total</b>                          | <b>N</b>      | <b>174</b>     | <b>N</b>       |
| Buffalo-Niagara Falls, NY/Fort Erie-Niagara Falls, Ont.     | N             | 54             | N              |
| Buffalo, NY/Fort Erie, Ont.                                 | N             | N              | N              |
| Niagara Falls, NY/Niagara Falls, Ont.                       | N             | N              | N              |
| Rainbow Bridge  | N             | N              | N              |
| Queenston Bridge  | N             | N              | N              |
| Whirlpool Bridge  | N             | N              | N              |
| Detroit, MI/Windsor, Ont.                                   | N             | 40             | N              |
| Ambassador/Windsor Bridge                                   | N             | N              | N              |
| Windsor-Detroit Tunnel                                      | N             | N              | N              |
| Blaine, WA/Douglas and Pacific Highway, B.C.                | N             | 19             | N              |
| Blaine, WA/Douglas, B.C.                                    | N             | N              | N              |
| Blaine, WA/Pacific Highway, B.C.                            | N             | N              | N              |
| Champlain-Rouses Pt., NY/Lacolle (Routes 15, 221,223), Que. | N             | 11             | N              |
| Champlain, NY/Lacolle Route 15, Que.                        | N             | N              | N              |
| Rouses Pt., NY/Lacolle Routes 221 and 223, Que.             | N             | N              | N              |
| Sault Ste. Marie, MI/Sault Ste. Marie, Ont.                 | N             | 10             | N              |

# Top Land Passenger Ports, Canadian-U.S. Border: 1996—Continued

(Thousands of vehicles or passengers/pedestrians)

| Port name   | Northbound   | Southbound   | Total        |
|---|--------------|--------------|--------------|
| <b>Passengers on buses<sup>a</sup></b>                      |              |              |              |
| <b>Canadian-U.S. border, total</b>                          | <b>3,232</b> | <b>3,871</b> | <b>7,103</b> |
| Buffalo-Niagara Falls, NY/Fort Erie-Niagara Falls, Ont.     | 1,004        | 1,419        | 2,422        |
| Buffalo, NY/Fort Erie, Ont.                                 | 306          | N            | N            |
| Niagara Falls, NY/Niagara Falls, Ont.                       | 698          | N            | N            |
| Rainbow Bridge  | 463          | N            | N            |
| Queenston Bridge  | 233          | N            | N            |
| Whirlpool Bridge  | 2            | N            | N            |
| Blaine, WA/Douglas and Pacific Highway, B.C.                | 300          | 479          | 780          |
| Blaine, WA/Douglas, B.C.                                    | 0            | N            | N            |
| Blaine, WA/Pacific Highway, B.C.                            | 300          | N            | N            |
| Detroit, MI/Windsor, Ont.                                   | C            | 564          | N            |
| Ambassador/Windsor Bridge                                   | C            | N            | N            |
| Windsor-Detroit Tunnel                                      | 276          | N            | N            |
| Champlain-Rouses Pt., NY/Lacolle (Routes 15, 221,223), Que. | 240          | 288          | 528          |
| Champlain, NY/Lacolle Route 15, Que.                        | 239          | N            | N            |
| Rouses Pt., NY/Lacolle Routes 221 and 223, Que.             | 0.9          | N            | N            |
| Sault Ste. Marie, MI/Sault Ste. Marie, Ont.                 | 170          | 122          | 292          |
| <b>Pedestrians</b>  |              |              |              |
| <b>Canadian-U.S. border, total</b>                          | <b>965</b>   | <b>614</b>   | <b>1,579</b> |
| Buffalo-Niagara Falls, NY/Fort Erie-Niagara Falls, Ont.     | 359          | 264          | 623          |
| Buffalo, NY/Fort Erie, Ont.                                 | 6            | N            | N            |
| Niagara Falls, NY/Niagara Falls, Ont.                       | 353          | N            | N            |
| Rainbow Bridge  | 334          | N            | N            |
| Queenston Bridge  | 18           | N            | N            |
| Whirlpool Bridge  | 0.2          | N            | N            |
| Sumas, WA/Huntingdon, B.C.                                  | 37           | 58           | 95           |
| Calais, ME/St. Stephen, N.B.                                | 36           | 42           | 78           |
| Bar Harbour and Portland, ME/Yarmouth, N.S. <sup>b</sup>    | 34           | 35           | 69           |
| Bar Harbour, ME/Yarmouth, N.S.                              | N            | 6            | N            |
| Portland, ME/Yarmouth, N.S.                                 | N            | 29           | N            |
| International Falls-Rainer, MN/Fort Frances, Ont.           | 18           | 34           | 52           |

<sup>a</sup>Includes charter, intercity and school buses.

<sup>b</sup>Port is a pedestrian/ferry combination crossing.

**KEY:** C = Data are confidential. N = Data are nonexistent.

**SOURCES**

**Northbound**

Statistics Canada. Culture, Tourism and the Center for Education Statistics Division. Special tabulations. (Ottawa, Ont.: 1998).

**Southbound**

U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).

**t a b l e** 9-2b

## Top Land Passenger Ports, Mexican-U.S. Border: 1996

(Thousands of vehicles or passengers/pedestrians)

| Port name                              | Northbound     | Southbound | Total    |
|--|----------------|------------|----------|
| <b>Personal vehicles</b>               |                |            |          |
| <b>Mexico-U.S. border, total</b>       | <b>75,589</b>  | <b>N</b>   | <b>N</b> |
| San Ysidro/Otay Mesa, CA/Tijuana, B.C. | 17,160         | N          | N        |
| El Paso, TX/Ciudad Juárez, Chih.       | 15,096         | 5,092      | U        |
| Laredo, TX/Nuevo Laredo, Tamps.        | 6,793          | 7,675      | 14,468   |
| Calexico, CA/Mexicali, B.C.            | 6,139          | N          | N        |
| Brownsville, TX/Matamoros, Tamps.      | 6,074          | 5,830      | 11,904   |
| <b>Passengers in personal vehicles</b> |                |            |          |
| <b>Mexico-U.S. border, total</b>       | <b>203,999</b> | <b>N</b>   | <b>N</b> |
| San Ysidro/Otay Mesa, CA/Tijuana, B.C. | 42,864         | N          | N        |
| El Paso, TX/Ciudad Juárez, Chih.       | 41,483         | N          | N        |
| Hildago, TX/Río Bravo, Tamps.          | 19,221         | N          | N        |
| Calexico, CA/Mexicali, B.C.            | 18,296         | N          | N        |
| Laredo, TX/Nuevo Laredo, Tamps.        | 16,932         | N          | N        |
| <b>Buses<sup>a</sup></b>               |                |            |          |
| <b>Mexico-U.S. border, total</b>       | <b>208,468</b> | <b>N</b>   | <b>N</b> |
| San Ysidro/Otay Mesa, CA/Tijuana, B.C. | 112,276        | N          | N        |
| Hildago, TX/Río Bravo, Tamps.          | 36,900         | N          | N        |
| Laredo, TX/Nuevo Laredo, Tamps.        | 25,498         | N          | N        |
| Del Rio, TX/Villa Acuña, Coah.         | 7,062          | N          | N        |
| Brownsville, TX/Matamoros, Tamps.      | 5,570          | N          | N        |
| <b>Passengers on buses<sup>a</sup></b> |                |            |          |
| <b>Mexico-U.S. border, total</b>       | <b>2,755</b>   | <b>N</b>   | <b>N</b> |
| San Ysidro/Otay Mesa, CA/Tijuana, B.C. | 1,095          | N          | N        |
| Hildago, TX/Río Bravo, Tamps.          | 738            | N          | N        |
| Laredo, TX/Nuevo Laredo, Tamps.        | 531            | N          | N        |
| Brownsville, TX/Matamoros, Tamps.      | 111            | N          | N        |
| El Paso, TX/Ciudad Juárez, Chih.       | 106            | N          | N        |
| <b>Pedestrians</b>                     |                |            |          |
| <b>Mexico-U.S. border, total</b>       | <b>42,541</b>  | <b>N</b>   | <b>N</b> |
| San Ysidro/Otay Mesa, CA/Tijuana, B.C. | 9,393          | N          | N        |
| Calexico, CA/Mexicali, B.C.            | 7,374          | N          | N        |
| Nogales, AZ/Nogales, Son.              | 4,417          | N          | N        |
| El Paso, TX/Ciudad Juárez, Chih.       | 4,405          | 4,615      | 9,021    |
| Brownsville, TX/Matamoros, Tamps.      | 3,801          | 3,157      | 6,958    |

<sup>a</sup>Includes charter, intercity and school buses.

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

**NOTE:** Personal vehicles and pedestrians, El Paso, TX/Ciudad Juárez, Chih. Northbound data are based on all El Paso entry crossings. Southbound data are based on a subset of these crossings.

### SOURCES

#### Northbound

U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).

#### Southbound

Data compiled by Texas A&M International University, Texas Center for Border Economic and Enterprise Development based on original data from bridge operators. Web site: [www.tamui.edu/coba/txcntr/](http://www.tamui.edu/coba/txcntr/)

**t a b l e** 9-3

## Top North American Air Passenger City Pairs: 1996

(Number of passengers)

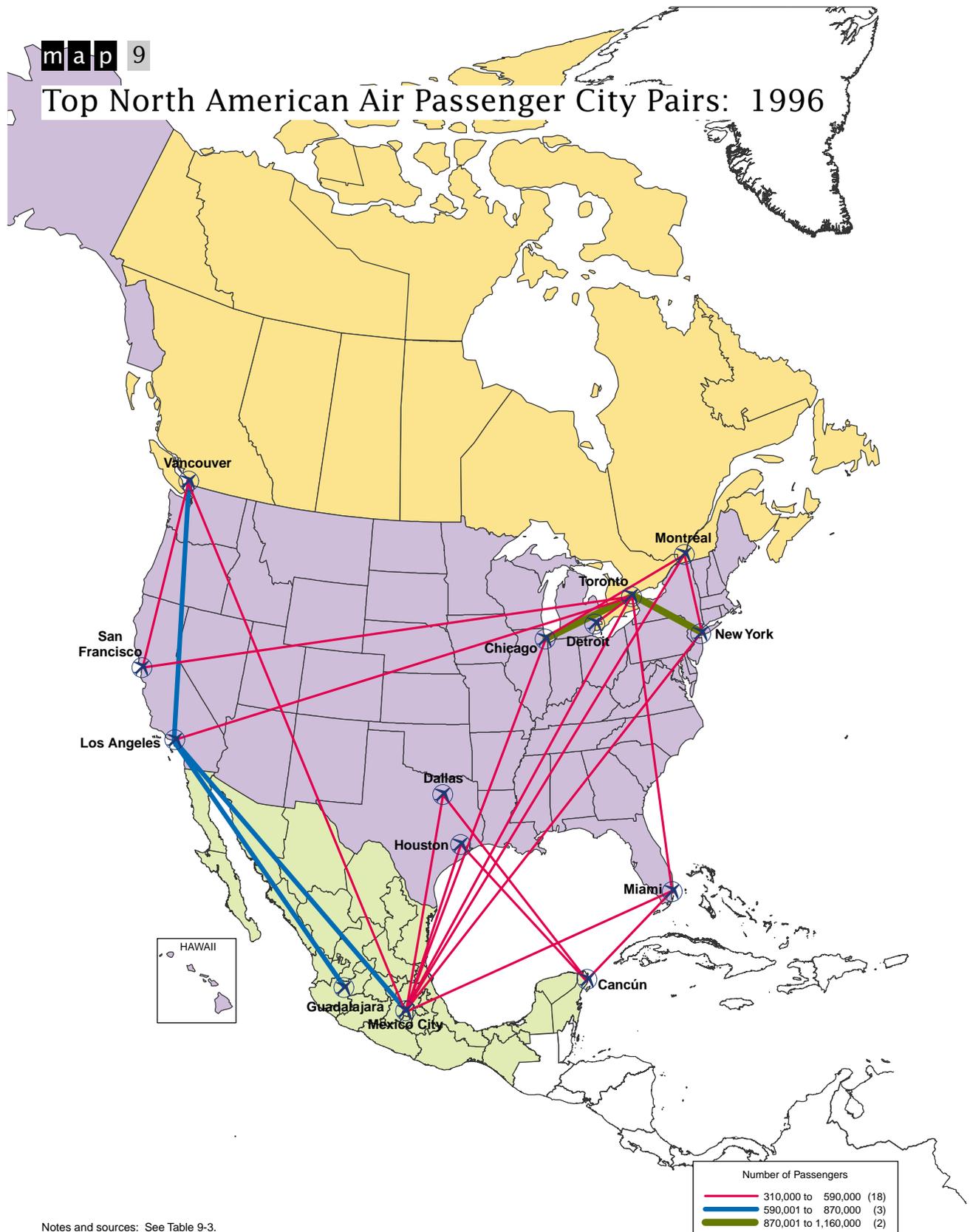
| Top city pairs                                  | Number of passengers | Top city pairs                                  | Number of passengers |
|---|----------------------|---|----------------------|
| <b>Canada-Mexico</b>                            | <b>C</b>             | <b>Mexico-United States, total</b>              | <b>12,089,424</b>    |
| Toronto-Mexico City/Mexico City-Toronto         | C                    | Los Angeles-Mexico City/Mexico City-Los Angeles | 743,340              |
| Montréal-Mexico City/Mexico City-Montréal       | C                    | Los Angeles-Guadalajara/Guadalajara-Los Angeles | 675,267              |
| Vancouver-Mexico City/Mexico City-Vancouver     | C                    | Miami-Cancún/Cancún-Miami                       | 566,141              |
| <b>Canada-United States, total</b>              | <b>15,005,834</b>    | Houston-Mexico City/Mexico City-Houston         | 535,703              |
| New York-Toronto/Toronto-New York               | 1,153,021            | Dallas-Mexico City/Mexico City-Dallas           | 505,333              |
| Chicago-Toronto/Toronto-Chicago                 | 1,023,494            | Miami-Mexico City/Mexico City-Miami             | 471,219              |
| Los Angeles-Vancouver/Vancouver-Los Angeles     | 604,953              | Dallas-Cancún/Cancún-Dallas                     | 447,445              |
| New York-Montréal/Montréal-New York             | 510,941              | Chicago-Mexico City/Mexico City-Chicago         | 385,832              |
| Miami-Toronto/Toronto-Miami                     | 425,852              | New York-Mexico City/Mexico City-New York       | 349,582              |
| San Francisco-Vancouver/Vancouver-San Francisco | 403,096              | Houston-Cancún/Cancún-Houston                   | 315,957              |
| Chicago-Montréal/Montréal-Chicago               | 386,146              |   |                      |
| Detroit-Toronto/Toronto-Detroit                 | 357,795              |   |                      |
| Los Angeles-Toronto/Toronto-Los Angeles         | 339,755              |   |                      |
| San Francisco-Toronto/Toronto-San Francisco     | 328,938              |   |                      |

**KEY:** C = Data are confidential.

**NOTE:** Canada-United States and Mexico-United States: These data represent the total number of passengers, both inbound and outbound traffic, traveling on scheduled and nonscheduled service of all U.S. and non-U.S. airlines. These data include origin and destination passengers and passengers traveling between these cities as part of a longer journey.

**SOURCE:** Canada-United States and Mexico-United States: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *T-100 Database*. Special tabulation. (Washington, DC: 1998).

# Top North American Air Passenger City Pairs: 1996



Notes and sources: See Table 9-3.

**t a b l e** 9-4a

## Canada-Mexico/Mexico-Canada Travel by Trip Purpose

(Thousands of visitors)

|   | 1990       | 1995       | 1996       |
|---|------------|------------|------------|
| <b>Canadian source data</b>                         |            |            |            |
| <b>Canadian resident overnight travel to Mexico</b> | <b>433</b> | <b>406</b> | <b>438</b> |
| Pleasure/tourism                                    | 402        | 356        | 386        |
| Business  | 13         | 32         | 38         |
| Visit family and friends                            | 10         | 10         | 6          |
| Other <sup>a</sup>                                  | 9          | 8          | 7          |
| <b>Mexican resident overnight travel to Canada</b>  | <b>63</b>  | <b>63</b>  | <b>80</b>  |
| Pleasure/tourism                                    | 39         | 38         | 46         |
| Business  | 10         | 11         | 18         |
| Visit family and friends                            | 12         | 12         | 13         |
| Other <sup>a</sup>                                  | 2          | 2          | 4          |
| <b>Mexican source data</b>                          |            |            |            |
| <b>Canadian resident overnight travel to Mexico</b> | <b>U</b>   | <b>U</b>   | <b>269</b> |
| Pleasure/tourism                                    | U          | U          | 210        |
| Business  | U          | U          | 20         |
| Visit family and friends                            | U          | U          | 36         |
| Other <sup>a</sup>                                  | U          | U          | 3          |
| <b>Mexican resident overnight travel to Canada</b>  | <b>U</b>   | <b>U</b>   | <b>17</b>  |
| Pleasure/tourism                                    | U          | U          | 11         |
| Business  | U          | U          | 4          |
| Visit family and friends                            | U          | U          | 1          |
| Other <sup>a</sup>                                  | U          | U          | 1          |

<sup>a</sup>Other includes personal, in transit, shopping, educational study and other.

**KEY:** U = Data are unavailable.

**SOURCES:**

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope)*, Catalogue No. 66-201-XPB. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

**Mexico**

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

**t a b l e** 9-4b

## Canada-United States/United States-Canada Travel by Trip Purpose

(Thousands of visitors)

|  | 1990          | 1995          | 1996          |
|--|---------------|---------------|---------------|
| <b>Canadian source data</b>                                    |               |               |               |
| <b>Canadian resident overnight travel to the United States</b> | <b>17,262</b> | <b>14,663</b> | <b>15,301</b> |
| Pleasure/tourism   | 10,586        | 8,316         | 8,810         |
| Business   | 1,972         | 2,260         | 2,422         |
| Visit family and friends                                       | 2,701         | 2,626         | 2,653         |
| Other <sup>a</sup>   | 2,003         | 1,462         | 1,418         |
| <b>Canadian resident same day travel to the United States</b>  | <b>53,171</b> | <b>37,491</b> | <b>37,398</b> |
| Pleasure/tourism   | 34,159        | 22,394        | 23,198        |
| Business   | 3,567         | 2,971         | 2,899         |
| Visit family and friends                                       | 4,703         | 3,473         | 3,235         |
| Other <sup>a</sup>   | 10,741        | 8,650         | 8,066         |
| <b>U.S. resident overnight travel to Canada</b>                | <b>12,252</b> | <b>13,005</b> | <b>12,909</b> |
| Pleasure/tourism   | 7,012         | 7,498         | 7,392         |
| Business   | 1,729         | 1,926         | 1,970         |
| Visit family and friends                                       | 2,602         | 2,323         | 2,221         |
| Other <sup>a</sup>   | 909           | 1,259         | 1,325         |
| <b>U.S. resident same day travel to Canada</b>                 | <b>22,482</b> | <b>24,325</b> | <b>25,563</b> |
| Pleasure/tourism   | 10,958        | 11,839        | 13,018        |
| Business   | 1,967         | 1,792         | 1,778         |
| Visit family and friends                                       | 5,385         | 3,923         | 3,895         |
| Other <sup>a</sup>   | 4,172         | 6,771         | 6,872         |

<sup>a</sup>Other includes personal, in transit, shopping, educational study and other.

### SOURCES

#### Canada

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope)*, Catalogue No. 66-201-XPB. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

#### United States

The United States does not collect data on same day travel to or from the United States nor for Canadian overnight travel to the United States for all modes of transportation and with travel characteristics. U.S. agencies typically obtain this data from Statistics Canada. The American Travel Survey also provides trip purpose data on U.S. travel to Canada for trips longer than 100 miles (approximately 160 kilometers). (See Appendix B for more information.)

**t a b l e** 9-5a

# Canada-Mexico/Mexico-Canada Travel<sup>a</sup> Characteristics: 1996

(Thousands of visitors)

|   | Pleasure/<br>tourism | Business  | Visit family<br>and friends | Other <sup>b</sup> | Total      |
|---|----------------------|-----------|-----------------------------|--------------------|------------|
| <b>Canadian source data</b>                         |                      |           |                             |                    |            |
| <b>Canadian resident overnight travel to Mexico</b> |                      |           |                             |                    |            |
| <b>Trip quarter</b>                                 | <b>386</b>           | <b>38</b> | <b>6</b>                    | <b>8</b>           | <b>438</b> |
| 1st quarter of the year                             | 235                  | 5         | 3                           | 4                  | 247        |
| 2nd quarter of the year                             | 45                   | 5         | 1                           | 3                  | 54         |
| 3rd quarter of the year                             | 27                   | 19        | 1                           | 1                  | 48         |
| 4th quarter of the year                             | 79                   | 9         | 1                           | 0                  | 89         |
| <b>Trip duration</b>                                | <b>386</b>           | <b>38</b> | <b>6</b>                    | <b>8</b>           | <b>438</b> |
| One-three nights                                    | 17                   | 18        | 0                           | 1                  | 36         |
| Four-thirteen nights                                | 234                  | 18        | 4                           | 3                  | 259        |
| More than 14 nights                                 | 136                  | 2         | 2                           | 4                  | 144        |
| <b>Age and gender of visitor</b>                    | <b>386</b>           | <b>38</b> | <b>6</b>                    | <b>8</b>           | <b>438</b> |
| <b>Males, total</b>                                 | <b>165</b>           | <b>21</b> | <b>3</b>                    | <b>3</b>           | <b>192</b> |
| Ages 14 and under                                   | 7                    | NS        | NS                          | NS                 | 7          |
| Ages 15-34  | 49                   | 4         | 1                           | 1                  | 55         |
| Ages 35-64  | 90                   | 16        | 1                           | 1                  | 108        |
| Ages 65+  | 18                   | NS        | NS                          | 1                  | 19         |
| <b>Females, total</b>                               | <b>212</b>           | <b>15</b> | <b>4</b>                    | <b>5</b>           | <b>236</b> |
| Ages 14 and under                                   | 9                    | 1         | NS                          | 0                  | 10         |
| Ages 15-34  | 73                   | 4         | 1                           | 2                  | 80         |
| Ages 35-64  | 113                  | 10        | 2                           | 2                  | 127        |
| Ages 65+  | 16                   | 1         | NS                          | 2                  | 19         |
| <b>Gender not stated, total</b>                     | <b>9</b>             | <b>1</b>  | <b>0</b>                    | <b>1</b>           | <b>11</b>  |
| <b>Mexican resident overnight travel to Canada</b>  |                      |           |                             |                    |            |
| <b>Trip quarter</b>                                 | <b>46</b>            | <b>18</b> | <b>13</b>                   | <b>4</b>           | <b>81</b>  |
| 1st quarter of the year                             | 8                    | 1         | 1                           | 0                  | 10         |
| 2nd quarter of the year                             | 12                   | 5         | 2                           | 1                  | 20         |
| 3rd quarter of the year                             | 18                   | 8         | 9                           | 1                  | 36         |
| 4th quarter of the year                             | 8                    | 4         | 1                           | 2                  | 15         |
| <b>Trip duration</b>                                | <b>46</b>            | <b>18</b> | <b>13</b>                   | <b>4</b>           | <b>81</b>  |
| One-three nights                                    | 9                    | 6         | 1                           | 0                  | 16         |
| Four-thirteen nights                                | 30                   | 10        | 6                           | 3                  | 49         |
| More than 14 nights                                 | 7                    | 2         | 6                           | 1                  | 16         |
| <b>Age and gender of visitor</b>                    | <b>46</b>            | <b>18</b> | <b>13</b>                   | <b>4</b>           | <b>81</b>  |
| <b>Males, total</b>                                 | <b>20</b>            | <b>13</b> | <b>5</b>                    | <b>2</b>           | <b>40</b>  |
| Ages 14 and under                                   | 1                    | NS        | 2                           | 0                  | 3          |
| Ages 15-34  | 12                   | 4         | 1                           | 2                  | 19         |
| Ages 35-64  | 6                    | 8         | 2                           | 0                  | 16         |
| Ages 65+  | 0                    | 0         | 1                           | 0                  | 1          |
| <b>Females, total</b>                               | <b>22</b>            | <b>3</b>  | <b>7</b>                    | <b>2</b>           | <b>34</b>  |
| Ages 14 and under                                   | 1                    | 0         | NS                          | 0                  | 1          |
| Ages 15-34  | 12                   | 1         | 4                           | 1                  | 18         |
| Ages 35-64  | 9                    | 2         | 3                           | 1                  | 15         |
| Ages 65+  | NS                   | NS        | 1                           | 0                  | 1          |
| <b>Gender not stated, total</b>                     | <b>4</b>             | <b>2</b>  | <b>1</b>                    | <b>1</b>           | <b>8</b>   |

<sup>a</sup>Travel here refers to trips of one or more nights.

<sup>b</sup>Other trip purposes include personal, in transit, shopping, educational study and other.

**KEY:** N = Data are nonexistent. NS = Not significant.

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**t a b l e** 9-5a

Canada-Mexico/Mexico-Canada Travel<sup>a</sup> Characteristics:  
1996–Continued

**SOURCES**

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope)*, Catalogue 66-201-XPB. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

**Mexico**

Mexican data was unavailable.

**t a b l e** 9-5b

# Canada-United States/United States-Canada Travel<sup>a</sup> Characteristics: 1996

(Thousands of visitors)

|  | Pleasure/<br>tourism | Business     | Visit family<br>and friends | Other <sup>b</sup> | Total         |
|--|----------------------|--------------|-----------------------------|--------------------|---------------|
| <b>Canadian source data</b>                                    |                      |              |                             |                    |               |
| <b>Canadian resident overnight travel to the United States</b> |                      |              |                             |                    |               |
| <b>Trip quarter</b>  | <b>8,809</b>         | <b>2,421</b> | <b>2,653</b>                | <b>1,417</b>       | <b>15,300</b> |
| 1st quarter of the year  | 2,094                | 565          | 501                         | 239                | 3,399         |
| 2nd quarter of the year  | 2,068                | 676          | 635                         | 365                | 3,744         |
| 3rd quarter of the year  | 3,165                | 624          | 907                         | 494                | 5,190         |
| 4th quarter of the year  | 1,482                | 556          | 610                         | 319                | 2,967         |
| <b>Trip duration</b>   | <b>8,809</b>         | <b>2,421</b> | <b>2,653</b>                | <b>1,417</b>       | <b>15,300</b> |
| One-three nights   | 3,924                | 1,286        | 1,394                       | 1,083              | 7,687         |
| Four-thirteen nights   | 3,607                | 1,066        | 1,039                       | 283                | 5,995         |
| More than 14 nights  | 1,279                | 69           | 220                         | 52                 | 1,620         |
| <b>Age and gender of visitor</b>                               | <b>8,809</b>         | <b>2,421</b> | <b>2,653</b>                | <b>1,417</b>       | <b>15,300</b> |
| <b>Males, total</b>  | <b>3,889</b>         | <b>1,502</b> | <b>1,048</b>                | <b>576</b>         | <b>7,015</b>  |
| Ages 14 and under  | 482                  | 22           | 130                         | 60                 | 694           |
| Ages 15-34   | 653                  | 340          | 200                         | 111                | 1,304         |
| Ages 35-64   | 2,165                | 1,098        | 521                         | 317                | 4,101         |
| Ages 65+   | 589                  | 42           | 197                         | 88                 | 916           |
| <b>Females, total</b>  | <b>4,427</b>         | <b>733</b>   | <b>1,416</b>                | <b>714</b>         | <b>7,290</b>  |
| Ages 14 and under  | 491                  | 27           | 140                         | 58                 | 716           |
| Ages 15-34   | 870                  | 226          | 321                         | 168                | 1,585         |
| Ages 35-64   | 2,445                | 449          | 713                         | 377                | 3,984         |
| Ages 65+   | 621                  | 31           | 242                         | 111                | 1,005         |
| <b>Gender not stated, total</b>                                | <b>494</b>           | <b>186</b>   | <b>189</b>                  | <b>127</b>         | <b>996</b>    |
| <b>U.S. resident overnight travel to Canada</b>                |                      |              |                             |                    |               |
| <b>Trip quarter</b>  | <b>7,392</b>         | <b>1,970</b> | <b>2,221</b>                | <b>1,325</b>       | <b>12,908</b> |
| 1st quarter of the year  | 695                  | 397          | 312                         | 201                | 1,605         |
| 2nd quarter of the year  | 1,936                | 589          | 561                         | 413                | 3,499         |
| 3rd quarter of the year  | 3,867                | 564          | 804                         | 480                | 5,715         |
| 4th quarter of the year  | 894                  | 420          | 544                         | 231                | 2,089         |
| <b>Trip duration</b>   | <b>7,392</b>         | <b>1,970</b> | <b>2,221</b>                | <b>1,325</b>       | <b>12,908</b> |
| One-three nights   | 4,433                | 1,356        | 1,332                       | 877                | 7,998         |
| Four-thirteen nights   | 2,765                | 600          | 789                         | 427                | 4,581         |
| More than 14 nights  | 194                  | 14           | 100                         | 21                 | 329           |
| <b>Age and gender of visitor</b>                               | <b>7,392</b>         | <b>1,970</b> | <b>2,221</b>                | <b>1,325</b>       | <b>12,908</b> |
| <b>Males, total</b>  | <b>3,291</b>         | <b>1,301</b> | <b>955</b>                  | <b>653</b>         | <b>6,200</b>  |
| Ages 14 and under  | 344                  | 18           | 109                         | 57                 | 528           |
| Ages 15-34   | 618                  | 213          | 181                         | 123                | 1,135         |
| Ages 35-64   | 1,744                | 1,027        | 492                         | 356                | 3,619         |
| Ages 65+   | 585                  | 43           | 173                         | 117                | 918           |
| <b>Females, total</b>  | <b>3,567</b>         | <b>584</b>   | <b>1,163</b>                | <b>539</b>         | <b>5,853</b>  |
| Ages 14 and under  | 360                  | 16           | 119                         | 40                 | 535           |
| Ages 15-34   | 656                  | 144          | 272                         | 117                | 1,189         |
| Ages 35-64   | 1,942                | 389          | 587                         | 295                | 3,213         |
| Ages 65+   | 609                  | 35           | 185                         | 87                 | 916           |
| <b>Gender not stated, total</b>                                | <b>534</b>           | <b>84</b>    | <b>103</b>                  | <b>133</b>         | <b>854</b>    |

<sup>a</sup>Travel here refers to trips of one or more nights.

<sup>b</sup>Other trip purposes include personal, in transit, shopping, educational study and other.

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**t a b l e** 9-5b

**Canada-United States/United States-Canada Travel<sup>a</sup>**  
**Characteristics: 1996–Continued**

**SOURCES**

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope)*, Catalogue No. 66-201-XPB. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

**United States**

The United States does not collect data on same day travel to or from the United States nor for Canadian overnight travel to the United States for all modes of transportation and with travel characteristics. U.S. agencies typically obtain this data from Statistics Canada.

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section 10

International  
Passenger Travel  
Between North  
America and the  
Rest of the World



**t a b l e** 10-1

## Passenger Travel Between North America and the Rest of the World by Mode of Transportation

(Thousands of visitors)

|   | 1990         | 1995         | 1996         |
|---|--------------|--------------|--------------|
| <b>Canada</b>   |              |              |              |
| <b>Travel to Canada (nonresident visitors)</b>            |              |              |              |
| <b>All modes</b>  | <b>3,185</b> | <b>4,257</b> | <b>4,697</b> |
| Air   | 2,154        | 2,918        | 3,215        |
| Land  | 992          | 1,299        | 1,432        |
| Water   | 39           | 41           | 50           |
| <b>Travel From Canada (Canadian resident reentries)</b>   |              |              |              |
| <b>All modes</b>  | <b>3,153</b> | <b>3,543</b> | <b>3,672</b> |
| Air   | 3,139        | 3,531        | 3,665        |
| Land  | 2            | NS           | NS           |
| Water   | 11           | 12           | 7            |
| <b>Mexico</b>   |              |              |              |
| <b>Travel to Mexico (nonresident visitors)</b>            |              |              |              |
| <b>All modes</b>  | <b>560</b>   | <b>931</b>   | <b>822</b>   |
| Air   | 410          | 719          | 723          |
| Land  | 91           | 105          | 99           |
| Water   | 59           | 107          | U            |
| <b>Travel From Mexico (Mexican residents)</b>             |              |              |              |
| <b>All modes</b>  | <b>300</b>   | <b>249</b>   | <b>307</b>   |
| Air   | 296          | 246          | 304          |
| Land  | 4            | 3            | 3            |
| Water   | U            | U            | U            |
| <b>United States</b>                                      |              |              |              |
| <b>Travel to the United States (nonresident visitors)</b> |              |              |              |
| <b>All modes</b>  | <b>N</b>     | <b>N</b>     | <b>N</b>     |
| Air   | 15,059       | 20,639       | 22,658       |
| Land  | N            | N            | N            |
| Water   | N            | N            | N            |
| <b>Travel From the United States (U.S. residents)</b>     |              |              |              |
| <b>All modes</b>  | <b>N</b>     | <b>N</b>     | <b>N</b>     |
| Air   | 15,990       | 19,059       | 19,786       |
| Land  | N            | N            | N            |
| Water   | N            | N            | N            |

**KEY:** N = Data are nonexistent. NS = Not significant. U = Data are unavailable.

**NOTES****All Countries**

Canadian, Mexican and U.S. data in this table do not include international travel within North America.

Data in this table are based on the traveler's country of residency.

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**t a b l e** 10-1**Passenger Travel Between North America and the Rest of the World  
by Mode of Transportation—Continued****Canada**

Travel to Canada: Represents nonresident visitors to Canada, excluding residents of the United States and Mexico.

Travel from Canada: Data are based on Canadian resident reentry data. Canadian resident reentry data represent Canadian residents returning from international destinations, other than the United States or Mexico. The reentry of Canadian residents to Canada may be made directly from an overseas country or via the United States. Canadian resident reentry data are similar but not exactly comparable with U.S. resident departure data. This is because Canadian residents may not necessarily leave and return by the same modes of transportation, and because Canadian residents could depart Canada in one calendar year and return in another.

**Mexico**

Travel to Mexico: Represents nonresident visitors to Mexico, excluding residents of Canada and the United States.

Travel from Mexico: Represents Mexican residents departing for international destinations other than Canada or the United States.

**United States**

Travel to the United States: Represents nonresident visitors to the United States, excluding residents of Canada and Mexico.

Travel from the United States: Represents U.S. residents departing for international destinations other than Canada or Mexico.

**SOURCES****Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope)*, Catalogue No. 66-201-XPB. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

**Mexico**

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

**United States**

U.S. Department of Commerce. International Trade Administration. Tourism Industries Office. *Summary of International Travelers to the U.S. and 1996 Outbound Travel*. (Washington, DC: 1997).

**t a b l e** 10-2

## Top International Origins and Destinations Outside of North America: 1996

(Thousands of visitors)

|                            | Total |                              | Total |                            | Total |
|----------------------------|-------|------------------------------|-------|----------------------------|-------|
| <b>Canada</b>              |       | <b>Mexico</b>                |       | <b>United States</b>       |       |
| <b>Country of origin</b>   |       | <b>Region of origin</b>      |       | <b>Country of origin</b>   |       |
| United Kingdom             | 691   | Central and South America    | 437   | Japan                      | 5,183 |
| Japan                      | 648   | Europe                       | 341   | United Kingdom             | 3,246 |
| France                     | 460   | Other (Australia and Africa) | 44    | Germany                    | 1,997 |
| Germany                    | 447   | Asia                         | U     | France                     | 987   |
| Hong Kong                  | 199   |                              |       | Brazil                     | 848   |
| South Korea                | 159   |                              |       | South Korea                | 749   |
| Australia                  | 149   |                              |       | Italy                      | 525   |
| Taiwan                     | 132   |                              |       | Venezuela                  | 447   |
| Netherlands                | 114   |                              |       | Australia                  | 463   |
| Switzerland                | 107   |                              |       | Netherlands                | 440   |
| <b>Destination country</b> |       | <b>Region of destination</b> |       | <b>Destination country</b> |       |
| United Kingdom             | 737   | Europe                       | 181   | United Kingdom             | 2,869 |
| France                     | 424   | Central and South America    | 88    | France                     | 1,860 |
| Germany                    | 236   | Other (Australia and Africa) | 26    | Germany                    | 1,642 |
| Cuba                       | 222   | Asia                         | 12    | Bahamas                    | 1,504 |
| Italy                      | 183   |                              |       | Italy                      | 1,385 |
| Netherlands                | 177   |                              |       | Jamaica                    | 1,029 |
| Hong Kong                  | 157   |                              |       | Japan                      | 871   |
| Switzerland                | 123   |                              |       | Netherlands                | 772   |
| Dominican Republic         | 112   |                              |       | Hong Kong                  | 752   |
| Spain                      | 92    |                              |       | Switzerland                | 693   |

**KEY:** U = Data are unavailable.

**NOTES:** Country/region of origin: Canadian data exclude residents of the United States and Mexico, even if the travel of a U.S. or Mexican resident originated in a third country, such as the United Kingdom. U.S. data exclude residents of Canada and Mexico, even if the travel of a Canadian or Mexican resident originated in a third country, such as the United Kingdom. Mexican data exclude residents of Canada and the United States and are only available at the regional level.

Destination country/region: Travel to countries within North America is excluded.

### SOURCES

#### Canada

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope)*, Catalogue No. 66-201-XPB. (Ottawa, Ont.: 1998).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

#### Mexico

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

#### United States

U.S. Department of Commerce. International Trade Administration. Tourism Industries Office. *Summary of International Travelers to the U.S. and 1996 Outbound Travel*. (Washington, DC: 1997).

**t a b l e** 10-3

## Top International Air Gateways, Excluding North American Travel: 1996

(Thousands of passengers)

| Gateway city  | Total | Gateway city  | Total  |
|---|-------|---|--------|
| <b>Canada</b>   |       | <b>United States</b>  |        |
| Total, Number of air passengers with international origins and destinations | C     | Total, number of air passengers with international origins and destinations | 84,656 |
| <b>Mexico</b>   |       | New York, NY (Kennedy, LaGuardia and Newark airports)                       | 20,145 |
| Total, number of air passengers with international origins and destinations | 1,779 | Miami, FL   | 12,484 |
| Mexico City, D.F.   | 1,360 | Los Angeles, CA   | 9,660  |
| Cancún, Q. Roo  | 408   | Honolulu, HI  | 5,397  |
| Mérida, Yuc.  | 9     | San Francisco, CA   | 4,965  |
| Villahermosa, Tab.  | 0.9   | Chicago, IL   | 4,100  |
| Chetumal, Q. Roo  | 0.8   | Atlanta, GA   | 2,833  |
| Palenque, Chis.   | 0.5   | Washington, DC (National and Dulles airports)                               | 2,486  |
| Tuxtla Gutiérrez, Chis.   | 0.2   | Boston, MA  | 2,341  |
|   |       | Detroit, MI   | 2,159  |

**KEY:** C = Data are confidential.

**NOTES:** Gateway represents the point of entry or exit for air passengers with international (non-North American) origins and destinations.

Mexico: These seven airports represent all Mexican international air gateways.

**SOURCES:**

**Mexico**

Aeropuertos y Servicios Auxiliares. *Resultado del Movimiento Aeroportuario. Enero-Diciembre, 1996.* (Mexico City, D.F.: 1997).

**United States**

U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *T-100 Database.* (Washington, DC: 1998).

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s e c t i o n 1 1

Transportation  
Infrastructure



**t a b l e 11-1**

# Domestic Physical System Extent

(Kilometers)

|                                     | Canada         |                |                | Mexico         |                |                | United States    |                  |                  |
|-------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|
|                                     | 1990           | 1995           | 1996           | 1990           | 1995           | 1996           | 1990             | 1995             | 1996             |
| <b>Road</b>                         | <b>888,898</b> | <b>901,904</b> | <b>U</b>       | <b>239,235</b> | <b>307,983</b> | <b>312,301</b> | <b>6,244,000</b> | <b>6,296,000</b> | <b>6,331,000</b> |
| Paved                               | 297,411        | 317,919        | U              | 83,925         | 96,541         | 99,165         | 3,635,000        | 3,819,000        | 3,830,000        |
| Major road system                   | N              | N              | N              | 81,517         | 92,782         | 94,908         | 655,000          | 692,000          | 697,000          |
| Less than four lanes                | N              | N              | N              | 75,995         | 83,772         | 85,346         | 451,000          | 468,000          | 470,000          |
| Four or more lanes                  | 15,516         | 16,571         | U              | 5,522          | 9,010          | 9,562          | 206,000          | 224,000          | 227,000          |
| Local                               | N              | N              | N              | N              | N              | N              | 2,980,000        | 3,125,000        | 3,133,000        |
| Unpaved                             | 591,487        | 583,985        | U              | 155,310        | 211,442        | 213,136        | 2,609,000        | 2,477,000        | 2,501,000        |
| <b>Great Lakes</b>                  | <b>2,662</b>   | <b>2,662</b>   | <b>2,662</b>   | <b>NA</b>      | <b>NA</b>      | <b>NA</b>      | <b>7,000</b>     | <b>7,000</b>     | <b>7,000</b>     |
| <b>Inland waterways<sup>a</sup></b> | <b>2,825</b>   | <b>2,825</b>   | <b>2,825</b>   | <b>NA</b>      | <b>NA</b>      | <b>NA</b>      | <b>42,000</b>    | <b>42,000</b>    | <b>42,000</b>    |
| <b>Pipeline</b>                     | <b>274,151</b> | <b>309,772</b> | <b>314,124</b> | <b>18,003</b>  | <b>15,616</b>  | <b>15,529</b>  | <b>2,278,262</b> | <b>2,353,910</b> | <b>2,364,985</b> |
| Gas                                 | 239,078        | 272,871        | 277,166        | 12,954         | 11,455         | 11,346         | 1,942,308        | 2,031,237        | 2,042,312        |
| Oil                                 | 35,073         | 36,901         | 36,959         | 5,049          | 4,161          | 4,183          | 335,954          | 322,673          | 322,673          |
| <b>Rail<sup>b</sup></b>             | <b>86,880</b>  | <b>80,326</b>  | <b>77,387</b>  | <b>26,361</b>  | <b>26,613</b>  | <b>26,612</b>  | <b>321,988</b>   | <b>290,356</b>   | <b>284,818</b>   |
| <b>Transit rail</b>                 | <b>N</b>       | <b>N</b>       | <b>N</b>       | <b>197</b>     | <b>275</b>     | <b>275</b>     | <b>N</b>         | <b>6,329</b>     | <b>6,961</b>     |

<sup>a</sup>Commercially navigable.

<sup>b</sup>Rail extent includes yard tracks, sidings and parallel lines.

**KEY:** N = Data are nonexistent. NA = Not applicable. U = Data are unavailable.

## NOTES

### All Countries

Road: The overall road total for Canada and the United States includes all roads (highways, local, and others). Canada cannot disaggregate its data for local roads into paved and unpaved, however.

Rail: Data include length of track, including yard tracks, sidings and parallel lines.

Transit rail: Data are one-way, fixed guideway.

### Mexico

Road: Data do not include local roads.

Road, paved: Data include major roads plus minor rural roads.

## SOURCES

### Canada

Road: Transportation Association of Canada. *Transportation in Canada: A Statistical Overview - 1995*. (Ottawa, Ont.: 1998).

Great Lakes and inland waterways: Transport Canada. *Marine Distance Library, 1997*. (Ottawa, Ont.: 1998).

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue No. 55-201-XPB*, and *Gas Utilities, Transport and Distribution Systems, Catalogue No. 57-205-XPB*. (Ottawa, Ont.: various years).

Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB*. (Ottawa, Ont.: various years).

### Mexico

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Evaluación. *Longitud de la Infraestructura Carretera, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Pipeline: Instituto Nacional de Estadística, Geografía e Informática, based on data from the Petróleos Mexicanos, Subdirección de Planeación and the *Anuario Estadístico* (various years). (Aguascalientes, Ags.: various years).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Transit: Instituto Nacional de Estadística, Geografía e Informática, based on data collected by the Sistema de Transporte Colectivo and the Sistema de Transporte Eléctrico in México City, the Sistema de Transporte Colectivo de la Zona Metropolitana in Guadalajara, and the Sistema de Transporte Colectivo in Monterrey. (Mexico City, D.F.: various years).

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**t a b l e 11-1****Domestic Physical System Extent—Continued****United States**

Road: U.S. Department of Transportation. Federal Highway Administration (FHWA). Unpublished data. (Washington, DC: 1998).

Great Lakes and inland waterways: U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).

Gas pipeline: American Gas Association. *Gas Facts*. (Arlington, VA: 1997).

Oil pipeline: Eno Transportation Foundation, Inc. *Transportation in America*. (Lansdowne, VA: 1997).

Freight rail: Association of American Railroads. *Railroad Facts*. (Washington, DC: 1997).

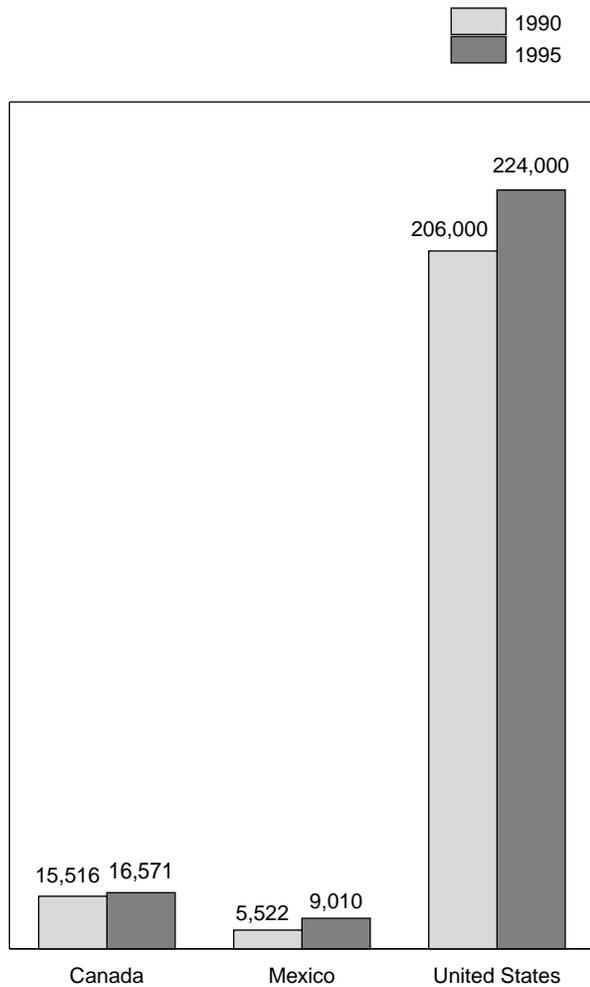
Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996).

Transit rail: American Public Transit Association. *Transit Fact book 1996*. (Washington, DC: 1996).

**figure** 11-1a

### Extent of Road Network (4 or More Lanes): 1990 and 1995

(Road extent in kilometers)

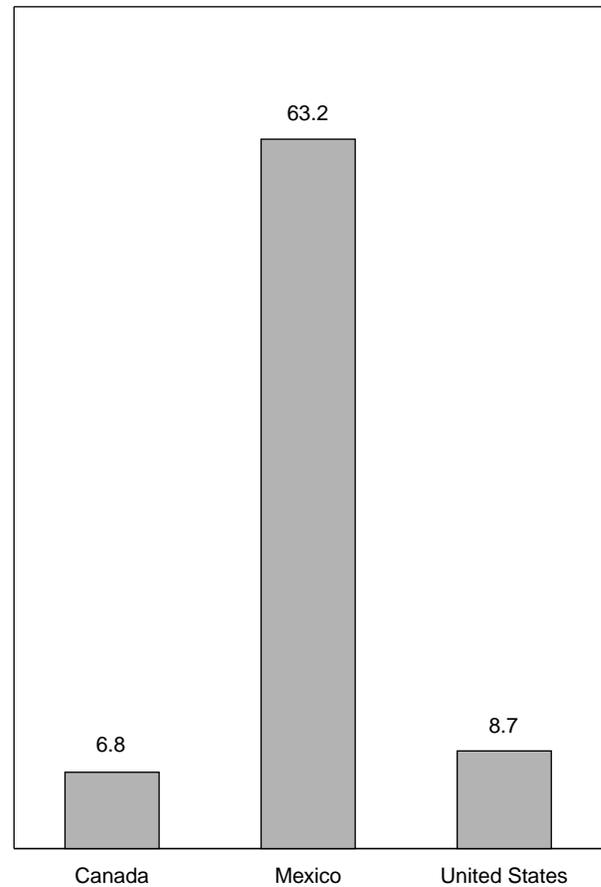


Notes and sources: See Table 11-1.

**figure** 11-1b

### Growth in Kilometers of Road (4 or More Lanes): 1990 to 1995

(Percent change)



Notes and sources: See Table 11-1.

**t a b l e** 11-2

## Number of Airports

|  | Canada       |              |              | Mexico       |              |              | United States |               |                  |
|--|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|------------------|
|  | 1990         | 1995         | 1996         | 1990         | 1995         | 1996         | 1990          | 1995          | 1996             |
| <b>Airports, total</b>   | <b>1,200</b> | <b>1,146</b> | <b>1,141</b> | <b>2,168</b> | <b>1,809</b> | <b>1,116</b> | <b>12,920</b> | <b>13,145</b> | <b>13,175</b>    |
| <b>Certified airports, total</b>   | <b>448</b>   | <b>435</b>   | <b>433</b>   | <b>82</b>    | <b>83</b>    | <b>83</b>    | <b>U</b>      | <b>572</b>    | <b>577</b>       |
| Percent with control towers  | 13           | 10           | 10           | 65           | 67           | 69           | U             | U             | <sup>a</sup> 67  |
| Percent with lighted runways   | 92           | 93           | 93           | 67           | 66           | 67           | U             | U             | <sup>a</sup> 100 |
| Percent with runways greater than or equal to 3,048 meters (10,000 feet) | 4            | 4            | 4            | 10           | 10           | 10           | U             | U             | <sup>a</sup> 19  |

<sup>a</sup>Percentages as of April 1998. Historical percentages are unavailable.

**KEY:** U = Data are unavailable.

### NOTES

#### All Countries

Data exclude heliports, stolports (short take-off and landing ports) and seaplane bases.

#### United States

Certified airports total for 1990: See Appendix B for an explanation of the number of certified U.S. airports for 1990.

### SOURCES

#### Canada

Natural Resources Canada. *Canada Flight Supplement*. (Ottawa, Ont.: 1998).

Transport Canada. *Aircraft Movement Statistics, TP577*. (Ottawa, Ont.: 1998).

#### Mexico

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

#### United States

U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation-1996*. (Washington DC: 1997).  
Web site: [api.hq.faa.gov/handbook96/toc96.htm](http://api.hq.faa.gov/handbook96/toc96.htm)

U.S. Department of Transportation. Federal Aviation Administration. *Administrators Fact Book, August, 1998 and December 1993*. (Washington, DC: 1999 and 1994).

U.S. Department of Transportation. Federal Aviation Administration. Private Communication. (Washington, DC: 1998).

**t a b l e** 11-2a

## Top 20 Canadian Airports by Flight Operations: 1996

(Number of flight operations (landings plus take-offs). Length and altitude in meters)

| Airport name                    | Number of flight operations <sup>a</sup> | Length of longest runway | Altitude above sea level | International airport? |
|---------------------------------|--|--------------------------|--------------------------|------------------------|
| Toronto/L.B. Pearson, Ont.      | 372,308                                  | 3,368                    | 173                      | Yes                    |
| Vancouver, B.C.                 | 329,960                                  | 3,353                    | 4                        | Yes                    |
| Calgary, Alta.                  | 221,329                                  | 3,863                    | 1,023                    | Yes                    |
| Montréal/Dorval, Que.           | 202,220                                  | 3,353                    | 36                       | Yes                    |
| Winnipeg, Man.                  | 126,233                                  | 3,353                    | 239                      | Yes                    |
| Ottawa/MacDonald-Cartier, Ont.  | 124,239                                  | 2,942                    | 114                      | Yes                    |
| Victoria, B.C.                  | 106,779                                  | 2,135                    | 19                       | No                     |
| Québec/Jean Lesage, Que.        | 103,464                                  | 2,743                    | 74                       | Yes                    |
| Halifax, N.S.                   | 97,725                                   | 2,682                    | 145                      | Yes                    |
| Montréal/St.-Hubert, Que.       | 92,617                                   | 2,390                    | 27                       | No                     |
| Edmonton International, Alta.   | 86,333                                   | 3,353                    | 723                      | Yes                    |
| Edmonton City Centre, Alta.     | 80,555                                   | 1,789                    | 671                      | No                     |
| Toronto/Buttonville, Ont.       | 71,683                                   | 1,189                    | 198                      | No                     |
| Toronto City Centre, Ont.       | 64,307                                   | 1,219                    | 77                       | No                     |
| London, Ont.                    | 63,949                                   | 2,682                    | 278                      | No                     |
| Boundary Bay, B.C.              | 61,215                                   | 1,145                    | 2                        | No                     |
| Saskatoon/JG Diefenbaker, Sask. | 59,488                                   | 2,530                    | 504                      | No                     |
| Vancouver Harbour, B.C.         | 53,156                                   | Heli-port                | 1                        | No                     |
| Thunder Bay, Ont.               | 51,341                                   | 1,890                    | 199                      | No                     |
| Regina, Sask.                   | 49,912                                   | 2,408                    | 577                      | No                     |

<sup>a</sup>Includes all civilian operations (air carriers, air taxis and general aviation), *excluding* local movements. For the definition of local movements, see Appendix B.

### SOURCES

Transport Canada. *Aircraft Movement Statistics, TP 577*. (Ottawa, Ont.: 1998).

Natural Resources Canada. *Canada Flight Supplement*. (Ottawa, Ont.: 1998).

**t a b l e** 11-2b

## Top 20 Mexican Airports by Flight Operations: 1996

(Number of flight operations (landings plus take-offs). Length and altitude in meters)

| Airport name              | Number of flight operations <sup>a</sup> | Length of longest runway | Altitude above sea level | International airport? |
|---------------------------|--|--------------------------|--------------------------|------------------------|
| Mexico City, D.F.         | 236,136                                  | 3,900                    | 2,237                    | Yes                    |
| Guadalajara, Jal.         | 124,948                                  | 4,000                    | 1,528                    | Yes                    |
| Monterrey, N.L.           | 76,004                                   | 3,000                    | 387                      | Yes                    |
| Cancún, Q. Roo.           | 73,308                                   | 3,500                    | 7                        | Yes                    |
| Toluca, Edo. de Méx.      | 48,088                                   | 4,200                    | 2,575                    | Yes                    |
| Hermosillo, Son.          | 46,695                                   | 2,300                    | 197                      | Yes                    |
| Culiacán, Sin.            | 44,561                                   | 2,300                    | 33                       | Yes                    |
| Tijuana, B.C.             | 41,088                                   | 2,960                    | 152                      | Yes                    |
| Chihuahua, Chih.          | 36,162                                   | 2,600                    | 1,360                    | Yes                    |
| Puerto Vallarta, Jal.     | 34,683                                   | 3,100                    | 6                        | Yes                    |
| Cd. del Carmen, Camp.     | 33,659                                   | 2,200                    | 2                        | No                     |
| Acapulco, Gro.            | 28,334                                   | 3,300                    | 5                        | Yes                    |
| Torreón, Coah.            | 27,854                                   | 2,750                    | 1,126                    | Yes                    |
| Mazatlán, Sin.            | 24,447                                   | 2,700                    | 10                       | Yes                    |
| Mérida, Yuc.              | 22,895                                   | 2,700                    | 11                       | Yes                    |
| Bajío (León), Gto.        | 21,343                                   | 3,500                    | 1,874                    | Yes                    |
| La Paz, B.C.S.            | 21,165                                   | 2,550                    | 21                       | Yes                    |
| Tampico, Tamps.           | 20,383                                   | 2,250                    | 25                       | Yes                    |
| San José del Cabo, B.C.S. | 18,722                                   | 2,200                    | 109                      | Yes                    |
| Villahermosa, Tab.        | 18,600                                   | 2,200                    | 13                       | Yes                    |

<sup>a</sup>Includes all civilian operations (air carriers, air taxis and general aviation), *including* local movements. (Canadian and U.S. data in Tables 11-2a and 11-2c exclude local movements.) For the definition of local movements, see Appendix B.

**SOURCE:** Aeropuertos y Servicios Auxiliares. *Resultado del Movimiento Aeroportuario, Enero-Diciembre de 1996.* (Mexico City, D.F.: 1997).

**t a b l e** 11-2c

## Top 20 U.S. Airports by Flight Operations: 1996

(Number of flight operations (landings plus take-offs). Length and altitude in meters)

| Airport name                              | Number of flight operations <sup>a</sup> | Length of longest runway | Altitude above sea level | International airport? |
|---|--|--------------------------|--------------------------|------------------------|
| Chicago/O'Hare Int'l, IL                  | 906,787                                  | 3,962                    | 204                      | Yes                    |
| Dallas/Ft Worth Int'l, TX                 | 874,735                                  | 4,085                    | 184                      | Yes                    |
| Los Angeles Int'l, CA                     | 760,482                                  | 3,685                    | 38                       | Yes                    |
| Atlanta Int'l, GA                         | 758,311                                  | 3,624                    | 313                      | Yes                    |
| Detroit Metro Wayne, MI                   | 536,892                                  | 3,658                    | 195                      | Yes                    |
| Miami Int'l, FL                           | 528,816                                  | 3,962                    | 3                        | Yes                    |
| Phoenix/Sky Harbor Int'l, AZ              | 514,767                                  | 3,353                    | 345                      | Yes                    |
| St. Louis Int'l, MO                       | 508,012                                  | 3,359                    | 184                      | Yes                    |
| Minneapolis/St. Paul Int'l, MN            | 479,807                                  | 3,355                    | 256                      | Yes                    |
| Boston/Logan Int'l, MA                    | 464,360                                  | 3,073                    | 6                        | Yes                    |
| Las Vegas/McCarran Int'l, NV              | 442,250                                  | 4,421                    | 664                      | Yes                    |
| Charlotte/Douglas Int'l, NC               | 455,751                                  | 3,048                    | 228                      | Yes                    |
| Newark, NJ                                | 454,191                                  | 2,835                    | 5.5                      | Yes                    |
| Denver Int'l, CO                          | 452,328                                  | 3,658                    | 1,655                    | Yes                    |
| Pittsburgh Greater Int'l, PA              | 443,158                                  | 3,505                    | 367                      | Yes                    |
| San Francisco, CA                         | 425,433                                  | 3,618                    | 3                        | Yes                    |
| Philadelphia Int'l, PA                    | 411,493                                  | 3,200                    | 7                        | Yes                    |
| Cincinnati Greater Int'l, KY <sup>b</sup> | 399,989                                  | 3,353                    | 273                      | Yes                    |
| Houston Intercontinental, TX              | 395,794                                  | 3,658                    | 30                       | Yes                    |
| Seattle/Tacoma Int'l, WA                  | 395,022                                  | 3,627                    | 131                      | Yes                    |

<sup>a</sup>Includes all civilian operations (air carriers, air taxis and general aviation), *excluding* local movements. For the definition of local movements, see Appendix B.

<sup>b</sup>Cincinnati Greater International Airport *is* in Kentucky.

### SOURCES

U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation-1996*. (Washington, DC: 1997).

U.S. Department of Transportation. Federal Aviation Administration. Office of Aviation Policy and Plans. Information Systems Branch. Private communication. (Washington, DC: 1998).

U.S. Department of Transportation. Federal Aviation Administration. Office of Airport Safety and Standards. Airport Safety and Operations Division. Special tabulation. (Washington, DC: 1998).



**t a b l e** 11-3

## Number of Water Ports and Facilities

|                | Canada     |            |            | Mexico     |            |            | United States |            |            |
|----------------|------------|------------|------------|------------|------------|------------|---------------|------------|------------|
|                | 1990       | 1995       | 1996       | 1990       | 1995       | 1996       | 1990          | 1995       | 1996       |
| <b>Total</b>   | <b>187</b> | <b>167</b> | <b>172</b> | <b>107</b> | <b>109</b> | <b>109</b> | <b>305</b>    | <b>309</b> | <b>321</b> |
| Coastal        | 118        | 99         | 104        | 107        | 109        | 109        | 187           | 183        | 194        |
| Atlantic       | 82         | 60         | 62         | NA         | NA         | NA         | 59            | 58         | 62         |
| Gulf of Mexico | NA         | NA         | NA         | 45         | 46         | 46         | 37            | 38         | 38         |
| Pacific        | 36         | 39         | 42         | 48         | 49         | 49         | 83            | 79         | 86         |
| Caribbean      | NA         | NA         | NA         | 14         | 14         | 14         | 8             | 8          | 8          |
| Great Lakes    | 51         | 46         | 44         | NA         | NA         | NA         | 73            | 82         | 82         |
| Inland         | 18         | 22         | 24         | NA         | NA         | NA         | 45            | 44         | 45         |

**KEY:** NA = Not applicable.

**SOURCES****Canada**

Statistics Canada. Transportation Division. Special tabulation. (Ottawa, Ont.: 1998).

**Mexico**

Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

**United States**

U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).

**t a b l e** 11-4a

## Top 20 Canadian Water Ports by Tonnage (Domestic and International): 1996

(Thousands of metric tons)

| Port name   |                |               |                | Containerized shipments<br>(as percent of total tonnage) | Number of vessel entrances/clearances |
|---|----------------|---------------|----------------|--|---------------------------------------|
|   | Total          | Domestic      | International  |  |                                       |
| Vancouver, B.C.                                       | 71,405         | 1,989         | 69,416         | 7.2  | 5,673                                 |
| Sept-Îles/Pte-Noire, Que.                             | 22,584         | 4,217         | 18,367         | NS   | 615                                   |
| Port-Cartier, Que.                                    | 21,729         | 5,132         | 16,597         | NS   | 521                                   |
| Saint John, N.B.                                      | 20,575         | 1,951         | 18,624         | 1.2  | 825                                   |
| Montréal/Contrecoeur, Que.                            | 19,208         | 5,261         | 13,947         | 41.1   | 1,827                                 |
| Québec/Lévis, Que.                                    | 16,987         | 3,681         | 13,306         | NS   | 740                                   |
| Halifax, N.S.   | 13,587         | 2,699         | 10,888         | 29.6   | 1,761                                 |
| Hamilton, Ont.  | 12,757         | 6,189         | 6,568          | NS   | 638                                   |
| Thunder Bay, Ont.                                     | 10,101         | 6,565         | 3,536          | NS   | 518                                   |
| Prince Rupert, B.C.                                   | 9,452          | 14            | 9,438          | NS   | 561                                   |
| Port Hawkesbury, N.S.                                 | 7,885          | 33            | 7,852          | NS   | 180                                   |
| Fraser River, B.C.                                    | 7,527          | 5,401         | 2,126          | 1.6  | 3,479                                 |
| Come-By-Chance, Nfld.                                 | 7,431          | 104           | 7,327          | NS   | 148                                   |
| Nanticoke, Ont.                                       | 6,790          | 1,671         | 5,119          | NS   | 305                                   |
| Baie-Comeau, Que.                                     | 5,867          | 1,834         | 4,033          | NS   | 1,089                                 |
| Sorel, Que.   | 5,580          | 3,306         | 2,274          | NS   | 317                                   |
| Sault Ste. Marie, Ont.                                | 5,152          | 545           | 4,607          | NS   | 291                                   |
| Windsor, Ont.   | 5,080          | 2,507         | 2,573          | NS   | 422                                   |
| Howe Sound, B.C.                                      | 4,864          | 4,856         | 8              | NS   | 2,517                                 |
| East Coast Vancouver Island, B.C.                     | 4,062          | 4,062         | 0              | NS   | 2,467                                 |
| Subtotal-top 20 ports                                 | 278,623        | 62,017        | 216,606        | 6.3  | 24,894                                |
| <b>Tonnage, total all Canadian water ports</b>        | <b>357,756</b> | <b>97,658</b> | <b>260,098</b> | <b>NA</b>  | <b>NA</b>                             |
| <b>Percent of tonnage of all Canadian water ports</b> | <b>77.9</b>    | <b>63.6</b>   | <b>83.3</b>    | <b>5.0</b>   | <b>NA</b>                             |

**KEY:** NA = Not applicable. NS = Not significant.

**NOTE:** Ports are ranked by total tonnage.

### SOURCES

Statistics Canada. *Shipping in Canada, Catalogue No. 54-205-XPB, 1996. (Ottawa, Ont.: 1998).*

Statistics Canada. Transportation Division. Special tabulations. (Ottawa, Ont.: 1998).

**t a b l e** 11-4b

## Top 20 Mexican Water Ports by Tonnage (Domestic and International): 1996

(Thousands of metric tons)

| Port name  |                |               |                | Containerized shipments<br>(as percent of total tonnage) | Number of vessel<br>entrances/<br>clearances |
|--|----------------|---------------|----------------|--|--|
|  | Total          | Domestic      | International  |  |  |
| Cayo Arcas, Camp.                                    | 31,471         | 4             | 31,467         | NA   | 417  |
| Pajaritos, Ver.                                      | 31,352         | 6,080         | 25,272         | NA   | 954  |
| Dos Bocas, Tab.                                      | 23,437         | 44            | 23,393         | NA   | 1,145  |
| Salina Cruz, Oax.                                    | 16,798         | 11,598        | 5,200          | 0.8  | 537  |
| Isla Cedros, B.C.                                    | 14,784         | 7,509         | 7,275          | NA   | 1,189  |
| Lázaro Cárdenas, Mich.                               | 12,007         | 3,721         | 8,286          | 0.8  | 425  |
| Manzanillo, Col.                                     | 9,994          | 3,818         | 6,176          | 16.8   | 704  |
| Veracruz, Ver.                                       | 9,917          | 631           | 9,286          | 23.2   | 1,396  |
| Tampico, Tamps.                                      | 8,374          | 2,390         | 5,984          | 6.4  | 1,148  |
| Tuxpan, Ver.   | 7,047          | 4,226         | 2,821          | 0.1  | 327  |
| Guerrero Negro, B.C.S.                               | 6,890          | 6,890         | N              | NA   | 1,077  |
| Guaymas, Son.  | 5,660          | 2,453         | 3,207          | NA   | 496  |
| Punta Venado, Q. Roo                                 | 6,021          | NS            | 6,021          | NA   | 106  |
| Topolobampo, Sin.                                    | 2,971          | 2,803         | 168            | NA   | 247  |
| San Marcos, B.C.S.                                   | 2,786          | 6             | 2,780          | NA   | 308  |
| Rosarito, B.C.                                       | 2,638          | 1,625         | 1,013          | NA   | 99   |
| Coatzacoalcos, Ver.                                  | 2,433          | 545           | 1,888          | NA   | 287  |
| Altamira, Tamps.                                     | 2,414          | 125           | 2,289          | 41.6   | 667  |
| Progreso, Yuc.                                       | 2,322          | 947           | 1,375          | 3.7  | 462  |
| La Paz-Pichilingue, B.C.S.                           | 2,015          | 1,852         | 163            | NS   | 600  |
| Subtotal-top 20 ports                                | 201,331        | 57,267        | 144,064        | 2.9  | 12,591                                       |
| <b>Tonnage, total all Mexican water ports</b>        | <b>208,581</b> | <b>63,450</b> | <b>145,131</b> | <b>NA</b>  | <b>NA</b>                                    |
| <b>Percent of tonnage of all Mexican water ports</b> | <b>96.5</b>    | <b>90.3</b>   | <b>99.3</b>    | <b>2.9</b>   | <b>NA</b>                                    |

**KEY:** N = Data are nonexistent. NA = Not applicable. NS = Not significant.

**NOTE:** Ports are ranked by total tonnage.

**SOURCE:** Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

**t a b l e** 11-4c

## Top 20 U.S. Water Ports by Tonnage (Domestic and International): 1996

(Thousands of metric tons)

| Port name   |                  |                |                  | Containerized shipments<br>(as percent of total tonnage) | Number of vessel entrances/clearances |
|---|------------------|----------------|------------------|--|---------------------------------------|
|   | Total            | Domestic       | International    |  |                                       |
| South Louisiana, LA                               | 172,200          | 96,204         | 75,996           | NS   | 153,386                               |
| Houston, TX                                       | 134,432          | 55,452         | 78,979           | 4.0  | 122,329                               |
| New York, NY and NJ                               | 119,389          | 68,145         | 51,244           | 12.6   | 228,526                               |
| New Orleans, LA                                   | 75,957           | 33,398         | 42,559           | 3.6  | 125,116                               |
| Baton Rouge, LA                                   | 73,492           | 41,026         | 32,466           | NS   | 68,922                                |
| Corpus Christi, TX                                | 72,993           | 21,629         | 51,364           | NS   | 32,957                                |
| Valdez, AK  | 69,960           | 68,006         | 1,954            | NS   | 3,186                                 |
| Plaquemine, LA                                    | 60,701           | 41,932         | 18,769           | NS   | 65,780                                |
| Long Beach, CA                                    | 52,976           | 20,292         | 32,684           | 35.0   | 56,465                                |
| Texas City, TX                                    | 51,160           | 19,108         | 32,052           | NS   | 23,462                                |
| Pittsburgh, PA                                    | 46,153           | 46,153         | -                | NS   | 118,283                               |
| Mobile, AL  | 46,144           | 23,014         | 23,129           | NS   | 47,943                                |
| Tampa, FL   | 44,718           | 29,443         | 15,275           | NS   | 10,234                                |
| Norfolk Harbor, VA                                | 44,690           | 9,411          | 35,279           | 15.0   | 32,064                                |
| Lake Charles, LA                                  | 44,540           | 17,913         | 26,627           | NS   | 49,303                                |
| Los Angeles, CA                                   | 41,449           | 16,267         | 25,183           | 37.8   | 37,226                                |
| Baltimore, MD                                     | 39,511           | 12,696         | 26,814           | 8.7  | 34,208                                |
| Philadelphia, PA                                  | 37,996           | 11,807         | 26,188           | 2.6  | 25,185                                |
| Duluth-Superior, MN and WI                        | 37,557           | 27,440         | 10,116           | NS   | 2,400                                 |
| Port Arthur, TX                                   | 33,710           | 5,896          | 27,813           | NS   | 12,890                                |
| Subtotal-top 20 ports                             | 1,200,060        | 565,569        | 634,491          | 6.0  | 1,249,865                             |
| <b>Tonnage, total all U.S. water ports</b>        | <b>2,072,090</b> | <b>998,529</b> | <b>1,073,561</b> | <b>NA</b>  | <b>NA</b>                             |
| <b>Percent of tonnage of all U.S. water ports</b> | <b>57.9</b>      | <b>56.6</b>    | <b>59.1</b>      | <b>6.0</b>   | <b>NA</b>                             |

**KEY:** NA = Not applicable. NS = Not significant.

**NOTE:** Ports are ranked by total tonnage.

**SOURCES**

Tonnage: U.S. Army Corps of Engineers. *Waterborne Commerce of the United States, National Summaries, Part 5.* (New Orleans, LA: 1996).

Percent of containerized shipments: U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).

**t a b l e** 11-5

## Toll Roads, Bridges and Tunnels

(Kilometers of toll roads or number of bridges/tunnels)

|                                 | Canada |      |      | Mexico |       |       | United States |       |      |
|---------------------------------|--------|------|------|--------|-------|-------|---------------|-------|------|
|                                 | 1990   | 1995 | 1996 | 1990   | 1995  | 1996  | 1990          | 1995  | 1996 |
| Toll roads, (total, kilometers) | 290    | 290  | 290  | 1,761  | 6,338 | 6,378 | 7,034         | 7,002 | N    |
| Toll bridges (total, number)    | 14     | 14   | 14   | 31     | 38    | 38    | 146           | 139   | N    |
| Toll tunnels (total, number)    | 1      | 1    | 1    | 0      | 0     | 1     | 9             | 9     | N    |

**KEY:** N = Data are nonexistent.

**NOTE**

**All Countries**

Intercountry toll bridges between the United States and Canada and the United States and Mexico have been included in the totals for each country. United States and Canadian data both include 11 international bridges and 1 international tunnel on the Canadian-U.S. border. United States and Mexican data both include 18 international bridges.

**SOURCES**

**Canada**

Transport Canada. Highway Policy Group. Special Tabulation. (Ottawa, Ont.: 1998).

**Mexico**

Secretaría de Comunicaciones y Transportes. Dirección General de Evaluación. *Longitud de la Infraestructura Carretera, 1990, 1995 and 1996.* (Mexico City, D.F.: various years).

**United States**

U.S. Department of Transportation. Federal Highway Administration. *Toll Facilities in the United States: Bridges, Roads, Tunnels, Ferries.* (Washington, DC: various years).



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s e c t i o n 12

Transportation  
Vehicles



table 12-1

## Number of Transportation Vehicles/Equipment

|                                | Canada            |                               |                               | Mexico            |                   |                     | United States              |                    |                            |
|--------------------------------|-------------------|-------------------------------|-------------------------------|-------------------|-------------------|---------------------|----------------------------|--------------------|----------------------------|
|                                | 1990              | 1995                          | 1996                          | 1990              | 1995              | 1996                | 1990                       | 1995               | 1996                       |
| <b>Air</b>                     | <b>23,674</b>     | <b>22,714</b>                 | <b>22,685</b>                 | <b>5,874</b>      | <b>6,426</b>      | <b>6,255</b>        | <b><sup>a</sup>197,200</b> | <b>196,800</b>     | <b>201,900</b>             |
| Commercial aircraft            | 5,775             | 5,752                         | 5,816                         | 847               | 1,283             | 1,184               | <sup>a</sup> 16,125        | 18,270             | 18,597                     |
| Jets                           | 344               | 380                           | 414                           | 100               | 175               | 177                 | <sup>a</sup> 5,166         | 5,724              | 6,158                      |
| Non-jets                       | 5,431             | 5,372                         | 5,402                         | 33                | 57                | 57                  | <sup>a</sup> 10,959        | 12,546             | 12,439                     |
| General aviation               | 17,899            | 16,962                        | 16,869                        | 5,027             | 5,143             | 5,071               | <sup>a</sup> 181,100       | 178,500            | 183,300                    |
| <b>Road</b>                    | <b>16,981,130</b> | <b><sup>r</sup>17,048,297</b> | <b><sup>r</sup>17,182,626</b> | <b>10,165,715</b> | <b>11,917,543</b> | <b>12,395,935</b>   | <b>193,057,376</b>         | <b>205,427,212</b> | <b>210,236,393</b>         |
| Personal vehicles              | 12,981,053        | 13,512,653                    | 13,562,927                    | 7,089,059         | 8,183,903         | 8,623,267           | 186,234,513                | 198,022,288        | 202,533,376                |
| Passenger cars                 | 12,622,038        | 13,192,272                    | 13,251,146                    | 6,839,337         | 8,046,926         | 8,436,909           | 133,700,496                | 128,386,775        | 129,728,341                |
| Motorcycles                    | 359,015           | 320,381                       | 311,781                       | 249,722           | 136,977           | 186,358             | 4,259,462                  | 3,897,191          | 3,871,237                  |
| Light trucks                   | N                 | N                             | N                             | N                 | N                 | N                   | 48,274,555                 | 65,738,322         | 68,933,798                 |
| Buses                          | 63,962            | 64,339                        | 64,550                        | 94,575            | 121,870           | <sup>p</sup> 98477  | 626,987                    | 685,503            | 696,609                    |
| Charter                        | 1,810             | 2,661                         | 3,305                         | U                 | U                 | U                   | N                          | N                  | N                          |
| Intercity                      | 1,356             | 1,191                         | 1,052                         | 30,579            | 47,254            | <sup>p</sup> 43,533 | N                          | N                  | N                          |
| Local motor                    | 11,243            | 10,852                        | 10,797                        | U                 | U                 | U                   | 58,714                     | 67,107             | <sup>p</sup> 67,874        |
| School                         | 29,726            | 27,934                        | 27,855                        | U                 | U                 | U                   | N                          | N                  | N                          |
| Commercial freight vehicles    | 176,368           | 181,568                       | 206,305                       | 2,982,081         | 3,611,770         | 3,674,191           | 6,195,876                  | 6,719,421          | 7,006,408                  |
| Single-unit trucks             | 40,719            | 33,463                        | 35,290                        | U                 | U                 | U                   | 4,486,981                  | 5,023,670          | 5,264,554                  |
| Tractors                       | 66,919            | 87,662                        | 92,059                        | U                 | U                 | U                   | 1,708,895                  | 1,695,751          | 1,741,854                  |
| <b>Rail</b>                    |                   |                               |                               |                   |                   |                     |                            |                    |                            |
| Cars                           |                   |                               |                               |                   |                   |                     |                            |                    |                            |
| Freight cars                   | <b>123,137</b>    | <b>110,784</b>                | <b>109,578</b>                | <b>46,602</b>     | <b>35,042</b>     | <b>29,438</b>       | <b>1,108,734</b>           | <b>1,134,203</b>   | <b>1,153,209</b>           |
| Intercity passenger train cars | 1,088             | 517                           | 466                           | 1,427             | 767               | 513                 | 1,863                      | 1,722              | 1,730                      |
| Locomotives                    | 3,562             | 3,299                         | 3,258                         | 1,677             | 1,400             | 1,318               | 19,153                     | 19,125             | 19,568                     |
| Freight                        | 3,351             | 3,171                         | 3,142                         | U                 | U                 | U                   | 18,835                     | 18,812             | 19,269                     |
| Intercity passenger            | 211               | 128                           | 116                           | U                 | U                 | U                   | 318                        | 313                | 299                        |
| <b>Transit</b>                 | <b>13,156</b>     | <b>13,140</b>                 | <b>13,049</b>                 | <b>N</b>          | <b>N</b>          | <b>N</b>            | <b>92,961</b>              | <b>115,874</b>     | <b><sup>p</sup>119,556</b> |
| Transit railcars               | 1,913             | 2,288                         | 2,252                         | 238               | 322               | 331                 | 15,747                     | 15,721             | <sup>p</sup> 16,006        |

table 12-1

## Number of Transportation Vehicles/Equipment—Continued

|                                    | Canada   |          |          | Mexico   |          |          | United States |                |                |
|------------------------------------|----------|----------|----------|----------|----------|----------|---------------|----------------|----------------|
|                                    | 1990     | 1995     | 1996     | 1990     | 1995     | 1996     | 1990          | 1995           | 1996           |
| <b>Water transport<sup>b</sup></b> | <b>N</b>      | <b>237,733</b> | <b>244,683</b> |
| Passenger vessels                  | N        | N        | N        | 62       | 58       | 57       | U             | 159,177        | 168,576        |
| Recreational boats                 | N        | N        | N        | N        | N        | N        | U             | 154,369        | 163,756        |
| Passenger cruise                   | 55       | 52       | 50       | N        | N        | N        | U             | 126            | 136            |
| Other passenger                    | 87       | 87       | 88       | 62       | 58       | 57       | U             | 4,682          | 4,684          |
| Freight vessels                    | 1,082    | 747      | 734      | 1,938    | 1,916    | 1,903    | U             | 74,375         | 76,107         |
| Liquid                             | 47       | 31       | 29       | 34       | 33       | 32       | 4,216         | 4,181          | 4,116          |
| Tanker                             | 44       | 31       | 29       | 34       | 33       | 32       | 213           | 195            | 178            |
| Tank/barge                         | 3        | 0        | 0        | N        | N        | N        | 4,003         | 3,986          | 3,938          |
| Dry bulk carrier                   | 83       | 74       | 73       | 3        | 1        | 1        | 81            | 78             | 72             |
| Other dry cargo                    | 89       | 40       | 40       | 242      | 229      | 222      | 27,940        | 28,039         | 29,429         |
| Container                          | 1        | 1        | 1        | N        | N        | N        | 89            | 91             | 88             |
| Specialized carrier                | 5        | 0        | 0        | 13       | 13       | 13       | 143           | 181            | 180            |
| General cargo                      | 62       | 39       | 39       | 22       | 16       | 15       | 592           | 390            | 386            |
| Dry cargo barge                    | 21       | 0        | 0        | 207      | 200      | 194      | 27,116        | 27,377         | 28,775         |
| Miscellaneous types                | 863      | 602      | 592      | 1,659    | 1,653    | 1,648    | U             | 42,077         | 42,490         |
| Fishing                            | 512      | 312      | 298      | 1,437    | 1,392    | 1,392    | U             | 35,658         | 36,038         |
| Offshore vessels                   | 44       | 23       | 27       | 25       | 56       | 56       | 1,177         | 1,291          | 1,275          |
| Tow boats <sup>c</sup>             | 0        | 178      | 178      | 80       | 97       | 91       | 5,213         | 5,128          | 5,177          |
| Other                              | 307      | 89       | 89       | 117      | 108      | 109      | N             | N              | N              |

<sup>a</sup>Air data are for 1992, the earliest year for which data are broken out in this fashion.

<sup>b</sup>Unless noted, water transport vessels represent those which are operated by the individual country but not necessarily owned. Vessels are organized according to the International Classification of Ship Type (ICST).

<sup>c</sup>Towboats include both pushboats and tugboats.

**KEY:** N = Data are nonexistent. p = Data are preliminary. r = Data are revised. U = Data are unavailable.

## t a b l e 12-1

Number of Transportation Vehicles/Equipment—*Continued***NOTES****All Countries**

**Air:** For Canada and the United States, on-demand air taxis are included in commercial aircraft and are excluded from general aviation. For the United States, this is different from the way the data are sometimes presented. For Mexico, air taxis are included in the total for commercial aircraft and are not identifiable as jet and non-jet in the registration files.

**Road:** Personal vehicles, light trucks: Mexico's total for personal vehicles includes light trucks (such as sports utility vehicles, pickups and minivans). However, it is not possible to further disaggregate light trucks. The U.S. total for personal vehicles does include light trucks, and light trucks are also identified as a separate vehicle category. Mexico may also include light trucks such as pickups in its total for commercial freight vehicles. Canada's total for personal vehicles *does not* include light trucks. However, light trucks *are* included in Canada's overall road total.

**Water Transport:** Freight vessels: The total for freight vessels represents the sum of the liquid, dry bulk carrier, other dry cargo and miscellaneous type vessel categories. Mexican data for container and tank barge vessels have not been included in its total because data for these types of vessels are nonexistent.

**Canada**

**Buses** (charter, intercity and local motor): Data are derived from a sample of Canadian companies engaged in scheduled intercity bus, urban transit, school bus, charter and other types of bus service from Statistics Canada's annual *Survey of the Passenger Bus and Urban Transit Industry*. Local motor buses are also included in the total number of transit vehicles.

**Commercial freight vehicles:** Data are based on Statistics Canada's *Motor Carriers of Freight Survey*, supplemented by data from Canada's vehicle registration files. The figure for commercial freight vehicles is not a sum of single-unit trucks and truck-tractors, because other types of freight vehicles are included in the commercial freight vehicles total. Data for single-unit trucks and truck-tractors are estimates for owner-operators and/or Canadian for-hire motor carriers earning annual revenues greater than or equal to \$25,000 (Canadian).

**Transit:** The total for Canadian transit includes transit rail and local motor bus. Transit rail includes commuter rail, heavy rail and light rail.

**Mexico**

**Commercial aircraft:** Includes taxis not identified in the records as jets or non-jets. Data for taxis are 714 in 1990, 1,051 in 1995 and 950 in 1996.

**Road** (intercity buses and commercial freight vehicles): Data refer to vehicles devoted to the federal public service and private service.

**United States**

**Air and general aviation:** Rounded to the nearest 100.

**Road:** All U.S. road data represent registered vehicles, except local motor buses which are active passenger vehicles. Totals for all road vehicles comprise all types of buses including intercity, charter, school and local motor bus. Local motor buses are also included in the total number of transit vehicles. Passenger cars include taxis. Light trucks include vans, pickup trucks and sports/utility vehicles

**Rail:** Freight rail cars (except those owned by car companies and shippers) and locomotives are Class I railroads only. See Appendix B for the number of freight rail cars owned by car companies and shippers.

**Transit:** The total for U.S. transit includes transit rail, local motor bus as well as trolley buses, ferries and transit for the disabled. Transit rail includes commuter rail, heavy rail and light rail. The number of commuter railcars includes locomotives.

**Water:** Recreation and fishing vessels: Represent U.S. owned- and operated-vessels.

**All other vessels:** Represent U.S. flagged vessels. U.S. flagged vessels are U.S. operated but not necessarily owned.

|   |   |   |   |   |      |
|---|---|---|---|---|------|
| t | a | b | l | e | 12-1 |
|---|---|---|---|---|------|

## Number of Transportation Vehicles/Equipment—Continued

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#### Canada

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Road: Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue No. 53-215-XPB*; *Road Motor Vehicle Registrations, Catalogue No. 53-219-XPB*; and, *Trucking in Canada, Catalogue No. 53-222-XPB.* (Ottawa, Ont.: various years).

Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB.* (Ottawa, Ont.: various years).

Transit: Statistics Canada. *Passenger Bus and Urban Transit, Catalogue 53-215-XPB.* (Ottawa, Ont.: various years).

Water transport: Lloyd's Register of Shipping. *Statistical Tables - 1990 Table 2*, and *World Fleet Statistics - Table 2*, Editions 1995 and 1996. (London, UK: various years).

#### Mexico

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras, 1990-1996.* (Mexico City, D.F.: 1997).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas, 1990, 1995 and 1996.* (Mexico City, D.F.: various years).

Road: Instituto Nacional de Estadística, Geografía e Informática based on data collected by the Departamento del Distrito Federal, Dirección General de Autotransporte Urbano, Direcciones de Policía y Tránsito Estatales y Municipales. (Mexico City, D.F.: various years).

Transit: Instituto Nacional de Estadística, Geografía e Informática. Dirección de Estadísticas Económicas. Based on data collected by the Sistema de Transporte Colectivo y Eléctrico in México City, Sistema de Transporte Eléctrico de la Zona Metropolitana in Guadalajara and Sistema de Transporte Colectivo in Monterrey. (Mexico City, D.F.: various years).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

#### United States

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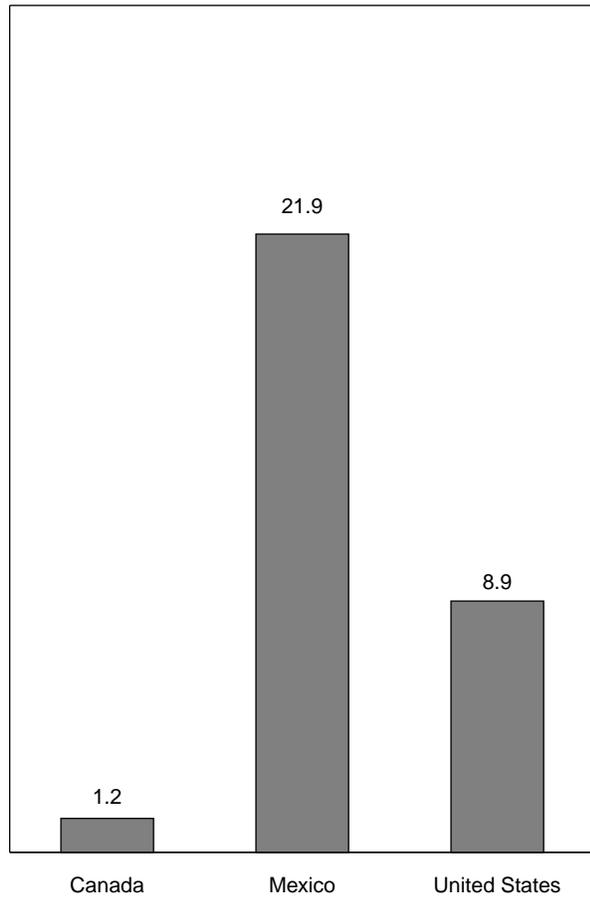
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U.S. Army Corps of Engineers. Navigation Data Center. *Waterborne Transportation Lines of the United States, Calendar Year 1996.* (New Orleans, LA: 1997).

**figure** 12-1a

### Growth in Number of Total Road Vehicles: 1990 to 1996

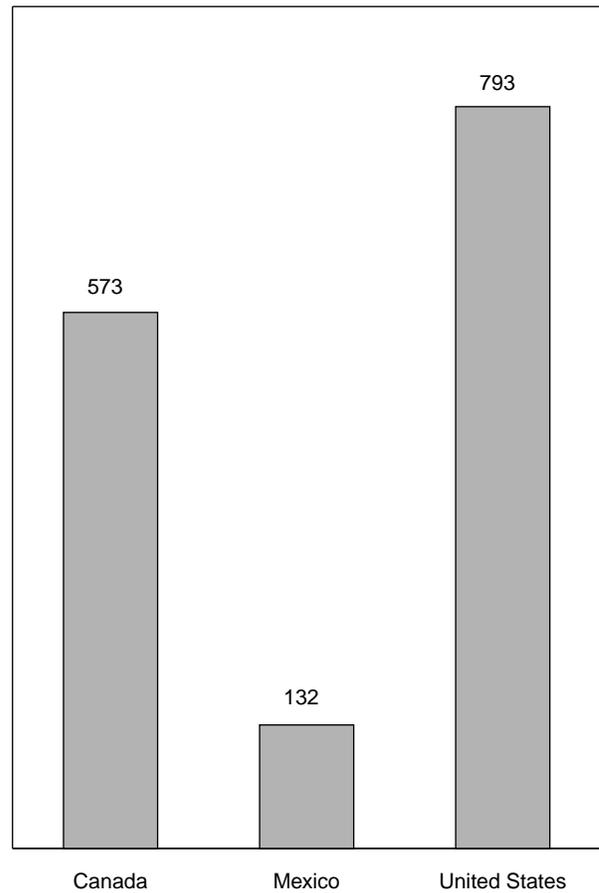
(Percent change)



Notes and sources: See Table 12-1.

**figure** 12-1b

### Total Road Vehicles per 1,000 Residents: 1996



Notes and sources: See Table 12-1 and Table 1-1.

**t a b l e** 12-2

## Vehicle-Kilometers by Mode

(Millions of vehicle-kilometers)

|                               | Canada     |                            |            | Mexico    |           |           | United States    |                  |                          |
|-------------------------------|------------|----------------------------|------------|-----------|-----------|-----------|------------------|------------------|--------------------------|
|                               | 1990       | 1995                       | 1996       | 1990      | 1995      | 1996      | 1990             | 1995             | 1996                     |
| <b>Air</b>                    | <b>N</b>   | <b>N</b>                   | <b>N</b>   | <b>N</b>  | <b>N</b>  | <b>N</b>  | <b>14,200</b>    | <b>13,600</b>    | <b>13,400</b>            |
| Air carriers                  | N          | N                          | N          | 125       | 358       | 306       | 6,400            | 7,500            | 7,700                    |
| <b>Road</b>                   | <b>N</b>   | <b><sup>e</sup>317,130</b> | <b>N</b>   | <b>N</b>  | <b>N</b>  | <b>N</b>  | <b>3,451,900</b> | <b>3,898,800</b> | <b>3,994,700</b>         |
| Personal vehicles             | N          | <sup>e</sup> 271,124       | N          | N         | N         | N         | 3,207,400        | 3,601,700        | 3,690,100                |
| Passenger cars                | N          | <sup>e</sup> 216,360       | N          | N         | N         | N         | 2,266,600        | 2,314,600        | 2,362,000                |
| Motorcycles                   | N          | <sup>e</sup> 1,044         | N          | N         | N         | N         | 15,400           | 15,800           | 15,900                   |
| Light trucks                  | N          | <sup>e</sup> 53,720        | N          | N         | N         | N         | 925,400          | 1,271,400        | 1,312,100                |
| Bus                           | 1,427      | 1,677                      | 1,604      | N         | N         | N         | 9,200            | 10,300           | 10,500                   |
| Charter                       | 100        | 135                        | 157        | N         | N         | N         | N                | N                | N                        |
| Intercity                     | 168        | 154                        | 130        | N         | N         | N         | N                | N                | N                        |
| Local motor                   | 769        | 742                        | 716        | N         | N         | N         | 3,400            | 3,500            | 3,500                    |
| School                        | 390        | 646                        | 600        | N         | N         | N         | N                | N                | N                        |
| Commercial freight vehicles   | N          | <sup>e</sup> 44,329        | N          | N         | N         | N         | 235,300          | 286,800          | 294,200                  |
| Single-unit trucks            | N          | N                          | N          | N         | N         | N         | 83,500           | 100,900          | 103,000                  |
| Tractor                       | N          | N                          | N          | N         | N         | N         | 151,800          | 185,900          | 191,200                  |
| <b>Rail, train-kilometers</b> | <b>125</b> | <b>140</b>                 | <b>135</b> | <b>48</b> | <b>39</b> | <b>41</b> | <b>665</b>       | <b>789</b>       | <b>803</b>               |
| Freight                       | 101        | 119                        | 113        | 27        | 24        | 26        | 612              | 737              | 754                      |
| Intercity passenger           | 24         | 21                         | 22         | 21        | 15        | 15        | 53               | 51               | 48                       |
| <b>Transit</b>                | <b>N</b>   | <b>N</b>                   | <b>N</b>   | <b>U</b>  | <b>U</b>  | <b>U</b>  | <b>5,217</b>     | <b>5,713</b>     | <b><sup>P</sup>5,895</b> |
| Transit rail                  | N          | N                          | N          | U         | U         | U         | 1,246            | 1,303            | 1,323                    |

**KEY:** e = Data are estimated. N = Data are nonexistent. p = Data are preliminary. U = Data are unavailable.

**NOTES**
**Canada**

Road, all data except bus: The number of total road vehicle kilometers for 1995 is an estimate. See Appendix B for explanation.

Bus: All bus data are from a sample of Canadian companies engaged in scheduled intercity bus, urban transit, school bus and charter and other types of bus service from Statistics Canada's annual *Survey of the Passenger Bus and Urban Transit Industry*.

Transit: Although vehicle kilometers for transit rail are nonexistent, vehicle kilometers for local motor bus are included under road, buses.

**Mexico**

Air: Includes only kilometers traveled by domestic airlines under scheduled operations serving domestic and international flights.

Road: Although no data are collected for vehicle travel on all Mexican roads, the Mexican Institute of Transport (IMT) estimates that the total vehicle-kilometers for all types of passenger cars, trucks and buses using the main interurban road corridors (of which there are 10) is approximately 36 billion vehicle kilometers per year. Main interurban road corridors comprise 25,190 kilometers or approximately 5 percent of the Mexican national highway network. For additional information on main interurban road corridors and Mexico's national road network, see the Secretaría de Comunicaciones y Transportes (SCT) report, *Modernization of the Main Highway System* (Mexico City, D.F.: 1998.)

**SOURCES**
**Canada**

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Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB*. (Ottawa, Ont.: various years).

Bus: Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue No. 53-215-XPB*. (Ottawa, Ont.: various years).

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**t a b l e** 12-2**Vehicle-Kilometers by Mode**—*Continued***Mexico**

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

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

**United States**

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a p p e n d i x

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Overview of  
Transportation  
Statistics in Canada,  
Mexico and the  
United States



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# a p p e n d i x A

## Overview of Transportation Statistics in Canada, Mexico and the United States

### OVERVIEW OF TRANSPORTATION STATISTICS IN CANADA

#### Overview of the Canadian Statistical System

The Canadian statistical system is relatively centralized. Statistics Canada is legislated, pursuant to the *Statistics Act*, as the central agency to collect, compile, analyze and publish statistical information relating to the commercial, industrial, financial, social, economic and general activities and condition of the Canadian people. However, all federal, provincial and territorial departments and agencies maintain statistical and administrative information in support of their roles and activities.

#### Specific Sources of Canadian Transportation and Transportation Related Data and Information

In addition to Statistics Canada, other organizations identified as collecting and/or maintaining transportation-related information include: Transport Canada, Canadian Coast Guard/Department of Fisheries and Oceans, Transportation Safety Board of Canada, Pilotage Authorities, and Railway Association of Canada. The following section discusses the roles and responsibilities of these agencies and organizations. This list represents many of the Canadian sources used in this publication, but should not be viewed as exhaustive. A brief description of each organization's general mission and functions is provided as well as its specific data

activities. However, detailed information on agency data activities are not described extensively here. Additional information on specific surveys, methodologies, dissemination and other items can be found at the web sites of individual organizations described below.

#### **Statistics Canada**

Web site: [www.statcan.ca](http://www.statcan.ca)

Statistics Canada is Canada's national statistical agency, with programs organized into three broad subject matter areas: demographic and social; socio-economic; and economic. Under the *Statistics Act*, Statistics Canada is required to collect, compile, analyze, abstract and publish statistical information on virtually every aspect of Canada's society and economy.

Statistics Canada is divided into about 60 divisions, each of which is responsible for a particular activity in the collection, processing or dissemination of statistics. These divisions are grouped together into the following six fields: (1) *Business and Trade Statistics*, (2) *National Accounts and Analytical Studies*, (3) *Social, Institutional and Labor Statistics*, (4) *Informatics and Methodology*, (5) *Management Services* and (6) *Communications and Operations*. Each of these fields reports to the Chief Statistician of Canada. Many divisions function as regular producers of a particular set of data, which is why there often will be a particular subject matter division identified as the originating

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source of data from Statistics Canada. Statistics are collected from different sources and in different ways. Statistics Canada data are generally produced from surveys but also can be generated as a by-product of administrative activities.

#### Business and Trade Statistics Field

The *Business and Trade Statistics Field* at Statistics Canada produces a wide range of monthly, quarterly and annual statistics on manufacturing, primary industries, transportation, communications, computing, construction, agriculture, merchandising services, external trade, prices, business finance, science and technology, small business, public finance, regional industrial structure and related areas. The *Industry Statistics Branch* and the *Prices, International Trade and Finance Statistics Branch* comprise the Business and Trade Statistics Field. The *Industry Statistics Branch* covers agriculture; transportation; distributive trades; manufacturing, construction and energy; and services. The *Prices, International Trade and Finance Statistics Branch* covers industrial organization and finance, international trade, investment and capital stock, prices, science and technology and small business and special surveys. The Transportation; International Trade; and Manufacturing, Construction and Energy divisions are major contributors to Canadian transportation data, and are described in more detail below.

Transportation Division. The Transportation Division collects, publishes and makes available statistics on air, rail, road and water transportation industries and on related traffic and infrastructures. The Transportation Division includes among its activities, the Aviation Statistics Centre, a Surface and Marine Section and a Multimodal unit. The Aviation Statistics Centre covers statistics on air carrier financial and operating statistics; air traffic at Canadian airports; volume of cargo; origin and destination of scheduled air passengers travelling within Canada,

between Canada and the United States and internationally; international and domestic air charter statistics; airport activity and traffic flow; fare type statistics; aircraft utilization.

The Surface and Marine Section and Multimodal unit cover railway financial and operating statistics, equipment and length of track, fuel consumption and employment statistics, freight and passenger traffic, freight loaded, receipts from and deliveries to U.S. rail connection, commodity movement between provinces and to and from U.S. regions, motor vehicle registrations and related licenses, gross and net sales of motor fuels. The Surface and Marine Section also includes trucking and marine units. The Trucking unit covers financial and operating statistics on motor carriers of freight; domestic, and international commodity origin-destination statistics of the Canadian domiciled for-hire trucking industry (domestic and international); private trucking statistics. The Marine unit covers financial and operating statistics on water carriers, including number and kind of vessels, employment, fuel consumption, type of service; shipping and port activities; commodities loaded and unloaded; containerized commodities; ports of loading and unloading; number, kind, operating status and registry (flag) of vessels arriving at and leaving Canadian ports; foreign port of origin, or destination.

Manufacturing, Construction and Energy Division. The Manufacturing, Construction and Energy Division conducts monthly surveys on manufacturing, forestry, construction and energy to produce a range of current indicators such as shipments or sales, inventories and orders. The division also conducts annual surveys covering manufacturing, forestry, construction, mineral fuels, pipelines and utility industries

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to produce a range of cost structure, material input, commodity output and employment data.

International Trade Division. The International Trade Division is responsible for the compilation, analysis and dissemination of Canada's merchandise exports and import statistics, including mode of transportation information, and related price and volume indexes. Beginning with the year 1996, a weight variable (in kilograms or metric tons) for each commodity traded internationally became available.

#### National Accounts and Analytical Studies Field

The *National Accounts and Analytical Studies Field* at Statistics Canada is responsible for providing a set of macroeconomic series within the five complex frameworks of the Canadian System of National Accounts. It provides a broad band of research and analysis intended to animate society's perception of social and economic behavior, and undertakes research and development statistical techniques. Two branches, *Analytical Studies* and the *System of National Accounts*, comprise the *National Accounts and Analytical Studies Field*. The *Analytical Studies Branch* covers business and labor market analysis, current economic analysis, family and community support systems, microeconomic studies and analysis and social and economic studies. The *System of National Accounts Branch* covers the balance of payments, industry measures and analysis, input-output, national accounts and environment and public institutions. The Balance of Payments, Input-Output, National Accounts and Environment and Public Institution divisions are major contributors to Canadian transportation data, and are described in more detail below.

Balance of Payments Division. The Balance of Payments Division produces statistics on

transactions and positions between Canada and other countries.

Input-Output Division. The Input-Output Division develops annual input-output tables and annual labor and multifactor productivity accounts for the business sector industries in Canada, interprovincial input-output tables with trade flows on an occasional basis and structural economic models of the Canadian and Provincial economies.

National Accounts and Environment Division. The National Accounts and Environment Division is responsible for the conceptual and statistical integration of Statistics within the System of National Accounts.

Public Institutions Division. The Public Institutions Division produces statistics on the financial activities and employment of the Canadian public sector.

#### Social, Institutional and Labor Statistics Field

The *Social, Institutional and Labor Statistics Field* at Statistics Canada conducts a wide range of statistical programs dealing with virtually all aspects of the social, institutional and labor market characteristics and activities of Canadians. The field is comprised of the *Census and Demographic Statistical Branch*, the *Institutional and Social Statistics Branch* and the *Labor and Household Survey Branch*. The *Census and Demographic Statistical Branch* covers census analysis; census operations; demography; and housing, family and social statistics. The *Institutional and Social Statistics Branch* covers culture, tourism, health and the Centre for Education Statistics. The *Labor and Household Survey Branch* covers household surveys, labor and household surveys analysis, labor and special surveys. The Census Operations; Labor and Household Surveys Analysis; and Culture, Tourism and Centre for Education

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Statistics divisions are major contributors to Canadian transportation data, and are described in more detail below.

Census Operations Division. The Census Operations Division is responsible for the planning, development and implementation of all production-related operations of the periodic decennial and quinquennial censuses of population, Canada's national inventory of key social-economic phenomena.

Labor and Household Surveys Analysis Division. The Labor and Household Surveys Analysis Division provides resources for the content, analysis and evaluation of income and labor market related data, including data on labor force status, occupation, labor compensation, pensions, industry, individual and family income and expenditure, for both census and sample surveys.

Culture, Tourism and the Centre for Education Statistics Division. The Culture, Tourism and the Centre for Education Statistics Division is responsible for Cultural Statistics, the Travel and Tourism Programs and Education Statistics. The Travel and Tourism Statistics Program manages two surveys: the *Canadian Travel Survey* (which measures Canadian domestic travel) and the *International Travel Survey* (which provides statistics on Canadian and Foreign international tourist movements). Statistics Canada is a major user of this information, in particular for the purpose of providing estimates of receipts and payments for the Travel Account component of the Balance of Payments. The information also is used by the National Accounts and Environment Division for the purpose of maintaining the Tourism Satellite Account, which provides a means of measuring tourism activities in relation to other economic activities in Canada. Other federal and provincial departments as well as many private-sector

business use tourism data to monitor market share and develop business strategies.

#### Informatics and Methodology Field

The *Informatics and Methodology Field* at Statistics Canada ensures that the statistical methodology used by all surveys is sound and statistically efficient, and provides leadership for and management of information processing in Statistics Canada. The field is comprised of the *Classification Systems Branch*; the *Informatics Branch* and the *Methodology Branch*. The *Classification Systems Branch* covers business register, geography, standards and tax data. The *Informatics Branch* covers informatic users services, the main computer center and systems development. The *Methodology Branch* covers business and social survey methods. The Business Register, Geography and Standards divisions are major contributors to Canadian transportation data, and are described in more detail below.

Business Register Division. The Business Register Division is responsible for the development and maintenance of a central register of firms and their constituent establishments for purposes of statistical collections.

Geography Division. The Geography Division maintains Statistics Canada's geographic classification infrastructure, develops geographic concepts and products and services for clients, including the census, and is the centre of expertise in the application of computerized geographic and cartographic techniques.

Standards Division. The Standards Division develops standard classifications, monitors their implementation and establishes official concordances between international and Canadian classifications. It standardizes economic and social concepts, and provides

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a system of comprehensive documentation for all surveys conducted in Statistics Canada. The Division played an important role in the development of the Standard Industrial Classification (SIC) and more recently with the development of the North American Industrial Classification System (NAICS).

#### Management Services Field

The *Management Services Field* at Statistics Canada organizes and coordinates internal management services, including the development and implementation of all management policies and systems within the agency and the assessment of the efficiency and effectiveness of these programs.

#### Communications and Operations Field

The *Communications and Operations Field* at Statistics Canada provides a full range of external communication functions, including respondent, user and media relations. It also administers the central and regional operational functions essential to the conduct of the agency's statistical programs, including regional data collection and processing activities, marketing, publishing and electronic data dissemination. The field is comprised of the *Marketing and Information Services Branch* and the *Regional Operations Branch*. The *Marketing and Information Services Branch* is responsible for communications, dissemination and marketing. The *Regional Operations Branch* is responsible for advisory services and survey operations. The *Advisory Services Division* provides an information dissemination network across the country through nine regional Reference Centres. Each Reference Centre has a collection of current publications and reference documents that provide customized output and analysis for a fee. The location of the regional reference centres can be found in all Statistics Canada publications,

or at the Statistics Canada web site: [www.statcan.ca/english/reference/Refcentre/refdoc.html](http://www.statcan.ca/english/reference/Refcentre/refdoc.html)

#### ***Transport Canada***

Web site: [www.tc.gc.ca](http://www.tc.gc.ca)

Transport Canada has traditionally played a key role in delivering a safe and efficient transportation system. With passage of the new *Canada Transportation Act* in 1996, the Department has implemented a number of changes, including commercializing many of its operational activities, overhauling transportation policy, streamlining regulations, reducing subsidies and cutting overhead. The role of the new Transport Canada is focused on the development of relevant transportation policies and legislation and maintenance of a high level of safety and security. The department of the future will no longer own, operate or subsidize large parts of the transportation system. The following sections highlight the areas in Transport Canada that collect, develop or maintain transportation statistics.

#### Policy Group

The *Policy Group* at Transport Canada is responsible for setting policies relating to trade and to rail, marine, motor carrier and air transportation; setting departmental strategic policy; assessing the performance of the overall transportation system and its components; and developing supporting information. Within the *Policy Group*, the *Economic Analysis Directorate* is responsible for meeting most of the statistical needs of the *Policy Group* and of Transport Canada.

The *Economic Analysis Directorate* meets these needs by identifying available data sources, such as Statistics Canada and other federal and provincial departments and agencies, implementing regulations to collect

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required data not available through other sources, initiating new surveys and other instruments to collect required data, purchasing information from recognized experts and identifying available data from other sources such as international organizations. The *Economic Analysis Directorate* also produces short, medium and long-term forecasts of aircraft traffic, marine and surface commodity flows and vessel movements.

### Safety and Security Group

The *Safety and Security Group* at Transport Canada is responsible for establishing and administering regulations and standards necessary for the safe conduct of Canadian civil aviation; monitoring the operation of NavCanada (the not-for-profit corporation whose primary mission is the safe, efficient and effective delivery of air navigation services); developing and enforcing marine regulations; and developing and enforcing the regulatory aspects of rail safety, the transport of dangerous goods, and motor vehicle and motor carrier safety and motor vehicle emissions.

Within the *Safety and Security Group*, the *Road Safety Directorate* collects, in cooperation with the Canadian Council of Motor Transport Administrators (CCMTA), motor vehicle traffic collision statistics from Canada's provincial and territorial jurisdictions. These statistics are stored in the Directorate's *Canadian Traffic Accident Information Database* (TRAID), and are published on an annual basis in a brochure entitled *Canadian Motor Vehicle Traffic Collision Statistics*, TP 3322. The *Road Safety Directorate* also provides to Natural Resources Canada, for publication in its annual *Motor Vehicle Fuel Consumption Guide*, fuel consumption ratings of new motor vehicles. The fuel consumption ratings are

submitted to Transport Canada by motor vehicle manufacturers who certify that the tests and calculations were carried out in accordance with approved Transport Canada methods.

The *Transport Dangerous Goods Directorate* also is part of the *Safety and Security Group*. Transport Canada is the focal point for the national program to promote public safety during the transportation of dangerous goods. The *Transport Dangerous Goods Directorate* serves as the major source of regulatory development, information and guidance on dangerous goods transport for the general public, industry and government. Through its various components, the Directorate works closely with other federal and provincial agencies to implement the safety program. The *Transport Dangerous Goods Directorate* maintains a *Dangerous Goods Accident Information System* (DGAIS), which contains over 100 elements of information for each accident involving dangerous goods reported to the directorate. Access to previous year's data is made possible by Statistics Canada.

In addition to these activities, the Canadian Transport Emergency Centre (CANUTEC) also is part of the *Transport Dangerous Goods Directorate*. The CANUTEC is a national bilingual advisory centre, which was established in 1979, and is operated by Transport Canada to assist emergency response personnel in handling dangerous goods emergencies. The CANUTEC has established a scientific information holding on chemicals manufactured, stored and transported in Canada. This holding consists of several data banks and includes Material Safety Data Sheets (MSDS) on more than 500,000 commercial products. The CANUTEC is staffed with professional scientists specialising in emergency response and

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experienced in interpreting technical information and providing advice. The CANUTEC has participated in a continental effort to consolidate the interpretations into an easy to use manual: *The 1996 North American Emergency Response Guidebook*. This guidebook provides information for the initial response to accidents involving any of the 3,000 categories of dangerous goods (this covers all of approximately 500,000 hazardous commercial products transported in Canada). More information on the CANUTEC can be found at their web site: [www.tc.gc.ca/canutec/en/menu.htm](http://www.tc.gc.ca/canutec/en/menu.htm)

### **Other Canadian Federal Agencies**

#### ***Transportation Safety Board of Canada***

Web site: [www.tsb.gc.ca](http://www.tsb.gc.ca)

The Transportation Safety Board of Canada was established as an independent board in 1990. The agency is concerned with the analysis of safety failures in the federally regulated elements of the marine, rail, pipeline and air transportation systems.

As part of its strategy to advance transportation safety, the Board produces, on an annual basis, modal publications (air, rail, water) reporting on the numbers of modal accidents, incidents, fatalities and injuries that have been reported to the Transportation Safety Board for the calendar year. The Board also makes use of information technologies, such as the Internet, to make safety information more readily available to industry and the public.

#### ***Pilotage Authorities***

The *Pilotage Act*, proclaimed in force February 1, 1972, created four pilotage regions with specific authorities. The four Pilotage Authorities (Atlantic, Laurentian, Great Lakes and Pacific) are Crown

Corporations and are responsible to the Canadian Parliament through the Minister of Transport. The role of each of these Pilotage Authorities is to establish, operate, maintain and administer, in the interest of safety, an efficient and economical pilotage service within their geographical boundaries. Each authority submits, through the Minister of Transport, an Annual Report to Parliament. These annual reports include financial statements concerning the respective authority's activities for the past year, as well as historical operating statistics indicating the average number of pilots and pilotage assignments, by compulsory pilotage area. Below are the web sites of the four pilotage regions.

Atlantic Pilotage Authority:

Web site: [www.canada.gc.ca/depts/agencies/apaind\\_e.html](http://www.canada.gc.ca/depts/agencies/apaind_e.html)

Great Lakes Pilotage Authority:

Web site: [www.canada.gc.ca/depts/agencies/glpind\\_e.html](http://www.canada.gc.ca/depts/agencies/glpind_e.html)

Laurentian Pilotage Authority:

Web site: [www.canada.gc.ca/depts/agencies/lpaind\\_e.html](http://www.canada.gc.ca/depts/agencies/lpaind_e.html)

Pacific Pilotage Authority:

Web site: [www.canada.gc.ca/depts/agencies/ppaind\\_e.html](http://www.canada.gc.ca/depts/agencies/ppaind_e.html)

#### ***St. Lawrence Seaway Management Corporation***

Web site: [www.seaway.ca](http://www.seaway.ca)

The St. Lawrence Seaway Management Corporation operates the St. Lawrence Seaway in conjunction with the U.S. St. Lawrence Development Corporation. The two organizations produce, on an annual basis, *The St. Lawrence Seaway Traffic Report*, a

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statistical publication detailing marine transport activity on the St. Lawrence Seaway. Information concerning the St. Lawrence Seaway Management Corporation also is readily available from its Annual Report(s) and from its web site.

**Canadian Coast Guard, Department of Fisheries and Oceans**

Web site: [www.ccg-gcc.gc.ca](http://www.ccg-gcc.gc.ca)

The Canadian Coast Guard's mandate is focused on sustainable ocean management that permits a safe, environmentally sustainable marine transportation system. It advances the ocean mandate both through its internal partnership with Department of Fisheries and Oceans sector counterparts and through its primary role of ensuring safe and environmentally responsible use of Canada's waterways. The Canadian Coast Guard organization splits into five business lines, which include marine navigation services; marine communications and traffic services; ice-breaking operations; rescue, safety and environmental response activities; and fleet management.

**Marine Atlantic Inc.**

Web site: [www.marine-atlantic.ca](http://www.marine-atlantic.ca)

Marine Atlantic Inc. is a federal Crown corporation, and its mission is to provide quality, safe and efficient transportation and hospitality services. It has a single mandate, the constitutional year-round ferry service linking Port aux Basques, Newfoundland, and North Sydney, Nova Scotia and the seasonal alternative ferry service between North Sydney and Argentina, Newfoundland. Information concerning Marine Atlantic's ferry services, including operational, financial and traffic information, is available from its Annual Report and on its web site.

**Natural Resources Canada**

Web site: [www.NRCan.gc.ca](http://www.NRCan.gc.ca)

The Energy Sector at Natural Resources Canada promotes the sustainable development and safe and efficient use of Canada's energy resources. The Energy Sector also provides technical knowledge and advice to the energy industry and to government. Its knowledge base helps the Canadian government create policies, implement regulations, meet international commitments and enhance job creation and economic growth.

**Nongovernment Organizations and Associations**

This list represents selected nongovernmental organizations and associations that were used as Canadian resources for this publication. This list should *not* be viewed as an exhaustive list of nongovernmental organizations and associations that maintain and analyze transportation and transportation related data for Canada. A brief description of each organization's general mission and functions is provided as well as its specific data activities.

**NAV CANADA**

Web site: [www.navcanada.ca](http://www.navcanada.ca)

NAV CANADA is the country's wholly private, not-for-profit provider of civil air navigation services (ANS). From over 130 facilities coast to coast, including Area Control Centers, Air Traffic Control Towers, Flights Service Stations and a network of electronic navigation aids, NAV CANADA delivers air traffic control flight information, and airport advisory services to the regional, national and international air transport communities and general aviation. NAV CANADA provides aircraft movement statistics that it records at Canada's airports to Transport Canada and the Aviation Statistics Center of Statistics Canada, for publication on an annual basis

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in their joint publication, *Aircraft Movements Statistics, TP 577*.

NAV CANADA also provides aircraft movement statistics it records at Canada's national airports to the Economic Analysis Directorate of Transport Canada. These statistics are used by Transport Canada to make forecasts, on a contractual basis with the national airports, of future aircraft movement volumes that the airport authorities use to plan their airport's future facility requirements. NAV CANADA also produces periodic publications that provide information relating to the Air Navigation System, as well as annual reports that provide a financial profile of its organization.

### ***Railway Association of Canada***

Web site: [www.railcan.ca/](http://www.railcan.ca/)

The Railway Association of Canada (RAC) is the industry association of freight, passenger and commuter railways that operate throughout Canada. Operating, financial and traffic information are available from the RAC web site and from their annual statistical report "Railway Trends." The RAC web site also identifies member railway companies and has links to the web site of member railways and the Transportation Safety Board of Canada.

| <b>Transportation statistical subject</b>                                       | <b>Canadian sources for data and analysis</b>  |
|---|--|
| Country Overview  | Statistics Canada  |
| Transportation and the Economy  | Statistics Canada and Transport Canada   |
| Transportation Safety   | Air: Transportation Safety Board of Canada and Transport Canada<br>Road: Transport Canada and Statistics Canada<br>Pipeline: Transportation Safety Board of Canada<br>Rail: Transportation Safety Board of Canada<br>Water: Transportation Safety Board of Canada and Canadian Red Cross |
| Transportation, Energy and the Environment                                      | Natural Resources Canada, Transport Canada and Statistics Canada   |
| Domestic Freight Activity   | Air: Statistics Canada<br>Water: Statistics Canada and Transport Canada<br>Pipeline: Statistics Canada<br>Road: Statistics Canada<br>Rail: Transport Canada and Statistics Canada  |
| North American Merchandise Trade  | Statistics Canada  |
| International Merchandise Trade Between North America and the Rest of the World | Statistics Canada  |
| Domestic Passenger Travel   | Air: Statistics Canada<br>Road: Statistics Canada and Transport Canada<br>Transit: Statistics Canada<br>Rail: Statistics Canada  |
| North American Passenger Travel   | Statistics Canada  |
| International Passenger Travel Between North America and the Rest of the World  | Statistics Canada  |
| Transportation Infrastructure   | Air: Natural Resources Canada and Transport Canada<br>Water: Transport Canada and Statistics Canada<br>Pipeline: Statistics Canada<br>Road: Transportation Association of Canada and Transport Canada<br>Rail: Statistics Canada   |
| Transportation Vehicles   | Air: International Civil Aviation Organization<br>Water: Lloyds Register of Shipping<br>Road: Statistics Canada and Transport Canada<br>Transit: Statistics Canada<br>Rail: Statistics Canada  |

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## **OVERVIEW OF TRANSPORTATION STATISTICS IN MEXICO**

### **Overview of the Mexican Statistical System**

The Instituto Nacional de Estadística, Geografía e Informática (INEGI or the National Institute of Statistics, Geography and Informatics) is the only federal agency in Mexico whose main responsibility is to gather, process, create, compile and disseminate statistical information on a wide variety of social and economic issues. INEGI receives its authority from the Ley de Información Estadística y Geográfica (Statistical and Geographic Information Act). In compliance with the *Statistical and Geographic Information Act*, INEGI is responsible for the coordination of the national statistical system and the national system on geography information, as well.

### **Specific Sources of Mexican Transportation and Transportation Related Data and Information**

In addition to INEGI, many federal agencies and institutions also gather, process, create, compile and disseminate statistics on transportation. These statistics are based on census projects, surveys by sampling and administrative records. In addition to these federal sources, many state and municipal governments also generate different types of statistical information, in support of their missions and as a by-product of specific administrative functions. A brief description of each organization's general mission and functions is provided as well as its specific data activities. However, detailed information on agency data activities are not described extensively here. Additional information can be found at the web sites of individual organizations described below.

### ***Instituto Nacional de Estadística, Geografía e Informática (INEGI)***

### ***National Institute of Statistics, Geography and Informatics***

Web site: [www.inegi.gob.mx](http://www.inegi.gob.mx)

INEGI's mandate includes statistics, geography and informatics (information technology). INEGI's Statistical Directorate is responsible for providing a wide range of information to the public. To achieve this mission, social, demographic and economic statistics are collected, processed and disseminated. Data are collected through population, economic and agricultural censuses; industry and activity specific surveys (for example: construction, employment, trade, and income and expenditure of households, amongst others); administrative records; and the national accounting system (which in turn, utilizes basic statistics generated by the INEGI and other institutions). To perform these data collection activities, INEGI relies upon 80 central sources and 60 local sources located throughout Mexico and within each of the country's states. INEGI disseminates all of its information through printed items and electronic materials, such as diskettes, CDs and the Internet

In terms of transportation statistics, INEGI mainly generates information through quinquennial census data, and through the annual data from Mexico's National Account System. Statistics on transportation and related issues also are produced or gathered through other INEGI projects. This is the case of data for vehicle registrations, traffic accidents, transportation characteristics for different modes of transportation.

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Among other responsibilities, INEGI also must provide the geographical information that Mexico requires for the planning and optimal use of territorial resources. At present, this is done in digital format through the Sistema Nacional sobre Información Geográfica (National System on Geographical Information).

**Secretaría de Comunicaciones y Transportes (SCT)**

**Ministry of Communications and Transportation**

Web site: [www.sct.gob.mx](http://www.sct.gob.mx)

The Secretaría de Comunicaciones y Transportes is responsible for the development of a modern, efficient and sufficient transportation and communication infrastructure that supports sustainable and sound economic growth in Mexico, and that promotes the improvement and broadening of efficient and high quality transportation and communication services. Within SCT, specific program areas are responsible for transportation, generally, and transportation statistics and information, specifically. These program areas are described below.

Coordinación General de Puertos y Marina Mercante (CGPMM)

General Coordination of Ports and Merchant Marine

The CGPMM is responsible for the establishment and implementation of policies, standards, systems and procedures for maritime and port activities that encourage the development of this transportation mode and port operations. This area provides statistical information about maritime and port activity, including data that describe the infrastructure and movement of freight shipments and passengers. The CGPMM *Anuario Estadístico: Movimiento de Carga,*

*Pasajeros y Buques* (Statistical Yearbook: Movement of Shipments, Passengers and Vessels

Dirección General de Puertos (DGP)

General Directorate of Ports

The DGP oversees the administration of concessions for Mexico's port administrations. This includes oversight concessions of specific facilities and their use, optimization, construction, operation and use of public property and the negotiation for the extension, amendment, annulment, recovery or early termination of a concession. The DGP also administers and oversees the construction, operation and use of goods at ports, terminals, marine and port facilities not under concession, and resolves any complaints that may be filed because of public bidding for concessions or agreements set forth by the (Ports Act) Ley de Puertos. In terms of statistics, this area gathers and publishes the data on individual ports, including ports' real estate registries (which provide a description of physical facilities of a port and associated bodies of water). It also publishes a statistical report, *Los Puertos Mexicanos en Cifras* (Mexican Ports in Figures), with information about port infrastructure, shipments, passenger and container activity, and dredging volumes.

Dirección General de Capitanías (DGC)

General Directorate of Port Authorities

The DGC coordinates and regulates the tasks performed by Mexico's Port Authorities (Capitanías de Puerto) and the relative delegations under their jurisdiction. It also provides oversight of the operations of the Port Authorities, and their correspondence with the applicable legal regulations. It also serves as the liaison office for the communication and coordination among

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other SCT offices relating to maritime transportation, including the Dirección General de Puertos, the Dirección General de Marina Mercante, the Capitanías de Puerto and other SCT offices and divisions. The DGC performs a followup and evaluation of the results of port and maritime activities. It also is responsible for providing the Harbour Masters with information about pertinent legal, operational, and technical regulations. In terms of statistics, the DGC designs software for the adequate control of port and maritime information and compiles statistics and a data bank on maritime and port operations.

#### Dirección General de Marina Mercante (DGMM)

##### General Directorate of Merchant Marine

The DGMM is responsible for the regulation, promotion, coordination and control of the Mexican merchant marine. In this capacity, it manages, coordinates and controls the *Registro Publico Marítimo Nacional* (National Maritime Public Registry) and the *Programa de Abanderamiento* (National Flag Vessel Registration). The DGMM registers and grants licenses to national flag vessels and Mexican naval vessels and equipment. In addition, the directorate compiles a *Anuario Estadístico del Sector Marítimo* (Statistical Yearbook of the Maritime Sector), which contains data on the navigation of ships and an inventory of maritime signaling.

#### Administraciones Portuarias Integrales (API)

##### Integrated Port Administrations

The APIs are generally public/private enterprises responsible for the management of 22 of Mexico's maritime ports. Of the current 22 APIs, 15 of these have a majority share from the Mexican Federal Government, 5 are under the control of state governments (Baja California Sur, Campeche, Quintana Roo,

Tabasco and Tamaulipas), 1 is completely private (Acapulco) and one is under the control of a Trust Fund (Cabo San Lucas). In addition to port management, the APIs maintain information about cargo and passenger activity and vessel entrances and clearances.

#### Aeropuertos y Servicios Auxiliares (ASA)

##### Airports and Auxiliary Services

Web site: [www.asa.org.mx](http://www.asa.org.mx)

This organization's responsibilities include administrating, operating, modernizing, building and maintaining Mexico's airport network, as well as raising security levels and increasing the network's stability and efficiency.

ASA administers 58 airports, 9 of which have been concessioned and sold to the private sector since 1998. ASA produces statistics that cover passenger, freight and mail activity in national and international civil aviation; income per service and operating costs; and a log of airport operations.

#### Caminos y Puentes Federales de Ingresos y Servicios Conexos (CAPUFE)

##### Federal Roads and Bridges and Related Services

Web site: [www.capufe.gob.mx](http://www.capufe.gob.mx)

CAPUFE is a decentralized federal agency that is in charge of the management, operation, conservation, rehabilitation, expansion, modernization and construction of roads and toll bridges. As part of its responsibilities, CAPUFE also generates statistics based on the vehicle registry that is taken at toll roads and bridges under its management. It also compiles organizational income and expense data.

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Dirección General de Aeronáutica Civil (DGAC)

General Directorate of Civil Aeronautics

This DGAC is responsible for the standards design, coordination and surveillance of national and international air public transportation services, and of auxiliary and related services and their facilities, and for the safety oversight of these services. It also is responsible for determining the necessary arrangements for concessions, permits and authorizations to provide air carrier and private general aviation transportation services. In terms of statistics, the DGAC is responsible for conducting and publishing studies, statistics and operational, financial and occupational data on passenger and freight transportation by the commercial air carriers, and the compilation of information about aviation accidents and incidents.

Dirección General de Autotransporte Federal (DGAF)

General Directorate of Federal Motor Carriers

The DGAF is responsible for the regulation, standards design, surveillance and sanctioning of public and private motor carrier services operating on roads under federal jurisdiction. It also is responsible for the design of the operational systems for the motor carrier services. The directorate generates statistics on the number of motor carrier companies and their vehicle fleets and the infrastructure related to such services.

Dirección General de Planeación (DGP)

General Directorate of Planning

The DGP is responsible for developing the objectives, strategies and guidelines for the transportation sector. It works to establish the effective steps and goals according to transportation policies and is involved in

developing the necessary planning tools to support these. The DGP also produces a cartography of the transport sector, publishes maps with infrastructure data, road maps and other graphical documents. In terms of transportation statistics, this area is responsible for compiling and publishing the *Anuario Estadístico del Sector Comunicaciones y Transportes* (Annual Statistical Report on the Communications and Transportation Sector). This report offers users a statistical compendium with the most relevant data on variables and basic indicators for all modes of transportation.

Dirección General de Policía Federal de Caminos y Puertos (DGPFCP)

General Directorate of Federal Highway and Ports Patrol

The mission of this directorate is to supervise, keep order and guarantee public safety on roads that are under federal jurisdiction. In terms of transportation statistics, the DGPFCP generates data on motor vehicle crashes, robberies and people arrested on roads under federal jurisdiction. Until the end of October 1999, this agency was part of SCT. After this time, it became part of the Secretaría de Gobernación (Ministry of Interior and Governmental Affairs).

Dirección General de Protección y Medicina Preventiva en el Transporte (DGPMP)

General Directorate of Protection and Preventive Medicine in Transport

The basic task of the DGPMP is to determine the physiological conditions that personnel involved in the operation of different modes of transportation and related services must meet, and to document the medical history of such personnel. In terms of statistics, the DGPMP keeps administrative records on

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medical and physiological exams, and toxicological tests conducted to decrease occupational hazards and accidents when providing transport services.

Dirección General de Servicios Técnicos (DGST)

General Directorate of Technical Services

In support of highway planning, the DGST conducts studies and performs and develops road programs for the construction, modernization and expansion of free (nontoll) highway traffic routes, toll roads and highways under concession. Through field surveys, it gathers data on the origin-destination, weights and dimensions of motor carriers and traffic volume on Mexico's national road network. In addition, the DGST creates and keeps an updated national inventory of infrastructure works.

Dirección General de Tarifas, Transporte Ferroviario y Multimodal (DGTTFM)

General Directorate of Rates, Railroad and Multimodal Transportation

The basic task of this unit is the definition of general principles for rate regulations of air, road and railway transportation services, and of the services offered and performed in ground and airport federal areas. The DGTTFM also is responsible for the coordination, regulation, control and sanctioning of services provided within the railway and multimodal transportation services, except for operational systems. In addition, because of the separation of several railroad lines from Mexico's national rail system, this unit is responsible for the gathering of data on railroad transportation, a task previously undertaken by the National Railroads of Mexico (Ferrocarriles Nacionales de México) prior to 1997.

Ferrocarriles Nacionales de México (FNM)

National Railroads of Mexico

The FNM is responsible for ensuring a safe, efficient and competitive railway system to help satisfy economic needs and establish closer ties between international and national markets. Due to the privatization of some lines of the (National Railway System) Sistema Ferroviario Nacional, since 1998 this agency only records statistical information for the Southeast Railways (Ferrocarril del Sureste) and short line railroads still under its control. (Prior to 1998, the FNM was responsible for statistical information for all of Mexico's railroads).

Instituto Mexicano del Transporte (IMT)

Mexican Institute of Transport

Web site: [www.imt.mx](http://www.imt.mx)

IMT is a technological research and development center under SCT. IMT was created in response to the need for modernizing infrastructure, optimizing operations, developing or adapting technologies according to the country's needs and promoting national industrial production. As part of its organizational mandate, IMT conducts research projects in the area of public and private transport. In addition, the Institute has several programs that are aimed at developing adequate human capital, through education and training, for the transportation sector.

IMT compiles and disseminates an annual *Manuel Estadístico del Sector Transporte* (Statistical Manual for the Transport Sector.) This publication includes official transportation and transportation related statistics for all modes of transport. The manual aims to offer those interested in the subject an overall perspective on the evolution of multimodal and intermodal

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transport in Mexico. Similarly, the IMT collaborates with SCT's Dirección General de Servicios Técnicos (Technical Services Directorate) to develop field surveys on the origin, destination, weight and size of road freight transport vehicles. IMT also processes this field data and publishes statistics periodically. This annual survey is known as the *Estudio Estadístico de Campo del Autotransporte Nacional* (Field Statistics Study of National Auto Transport).

Servicios a la Navegación en el Espacio Aéreo Mexicano (SENEAM)

Navigation Services in Mexican Air Space

Web site: [www.sct.gob.mx/estructura/seneam.htm/](http://www.sct.gob.mx/estructura/seneam.htm/)

SENEAM provides air traffic control services, aeronautical meteorology, radio-aided navigation, aeronautical telecommunications, airplane dispatching, aeronautical information, operational messages, administrative services of any kind required by companies, government offices, agencies or individuals in national and international air transport activities, and all services necessary to guaranty safety, order and a smooth traffic flow. SENEAM also generates statistical information on infrastructure, equipment, operation and support services for air navigation, as well as writing, updating and distributing the *Publicación de Información Aeronáutica* (Aeronautical Information Publication).

Unidad de Autopistas de Cuota (UAC)

Toll Highway Unit

The UAC is responsible for permits and authorizations for the construction of road access, crossings and facilities for Mexico's toll roads. The unit is also in charge of recording the fees being collected at toll roads and bridges. In terms of statistics, this office

gathers data on all vehicles that travel on toll roads and bridges and conducts statistical analysis and operational evaluations. In its statistical analysis, the UAC includes data from the Caminos y Puentes Federales de Ingresos y Servicios Conexos (Federal Roads and Bridges and Related Services) in calculating the levels of vehicle traffic. These data are measured in annual and monthly average daily traffic.

**Other Mexican Federal Agencies**

***Banco de Mexico, BANXICO***

***Bank of Mexico***

Web site: [www.banxico.org.mx](http://www.banxico.org.mx)

BANXICO's chief purpose is to supply national currency to the country's economy. In achieving this goal, the central bank's primary objective is to maintain the stability of the currency's purchasing power. The bank also helps promote the development of the financial system and ensures a smooth functioning of payment systems. In coordination with other organizations, BANXICO is responsible for compiling, analyzing and publishing economic and financial statistics. In terms of transportation statistics, BANXICO generates data on tourism flows, differentiating between tourists that enter or leave the country by land or by air.

***Comisión Nacional para el Ahorro de Energía, CONAE***

***National Commission for Energy Conservation***

Web site: [www.conae.gob.mx](http://www.conae.gob.mx)

The Commission serves as a technical consulting agency on energy conservation and efficiency for federal agencies and entities, state and municipal governments, and individuals. The Commission is comprised of representatives from several

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other federal Ministries. CONAE is responsible for promoting energy conservation across all sectors of the Mexican society and economy. Specifically, CONAE's most important functions are promoting, coordinating and evaluating strategies; programs and action on energy conservation and efficiency; and developing and disseminating research, technologies and studies to support these objectives.

### ***Comisión Reguladora de Energía, CRE***

#### ***Energy Regulation Commission***

Web site: [www.cre.gob.mx](http://www.cre.gob.mx)

The mission of the CRE is to promote efficient development of the gas and electrical energy sectors for the benefit of users. To meet this objective, the Commission regulates the electric and natural gas industries in Mexico. The activities regulated and defined in the *Ley de la CRE* (CRE Act) are generating, operating, transforming, marketing and supplying electrical energy, as well as regulating the transport, storage and distribution of petroleum and natural gas.

### ***Instituto Nacional de Ecología, INE***

#### ***National Institute of Ecology***

Web site: [www.ine.gob.mx](http://www.ine.gob.mx)

The INE is part of the Secretaría de Medio Ambiente, Recursos Naturales y Pesca (Ministry of the Environment, Natural Resources and Fisheries), and is responsible for developing environmental policies and applying different provisions for regulating and managing the environment. Its responsibilities cover both sectoral as well as regional subjects. Because of the impact that transportation has on the environment, INE also engages in transportation related activities and projects. Among these are: determining standards for the maximum

allowable levels for automotive vehicle emissions; carrying out emissions inventories of the atmosphere by sector and greenhouse effect gases; evaluating the environmental impact for building and operating general transport routes (roadways, railways, airports, etc.); establishing air quality monitoring networks; and gathering information from these activities.

### ***Instituto Nacional de Migración, INM***

#### ***National Institute of Migration***

The INM is part of the Secretaría de Gobernación (Ministry of Interior and Governmental Affairs,) and is in charge of planning, executing, controlling, supervising and evaluating migratory services, as well as coordinating with other federal agencies that also have responsibilities in the area of migration. INM documents and registers the entrance and exit of nationals and foreigners by land, air or maritime routes. Statistical information is generated according to concepts established in the *Ley General de Población* (General Population Act) and is provided monthly to the Bank of Mexico to determine figures for tourist income and expenditures.

### ***Petróleos Mexicanos, PEMEX***

#### ***Mexican Petroleum Company***

Web site: [www.pemex.org.mx](http://www.pemex.org.mx)

PEMEX is a public, decentralized agency that is responsible for the exploration and exploitation of hydrocarbons and the production, storage, distribution and commercializing of petroleum and petrochemical products in Mexico. The agency generates a wide array of information on these activities.

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**Secretaría de Comercio y Fomento Industrial, SECOFI**

**Ministry of Trade and Industrial Development**

Web site: [www.secofi.gob.mx/](http://www.secofi.gob.mx/)

The Secretaría de Comercio y Fomento Industrial is a federal executive agency that has as its mission the following functions: formulating and developing general policies in the areas of industry, mining, international trade, domestic trade and supply; regulating, directing and estimating consumer protection measures; registering industrial property and commercial ownership; overseeing and regulating foreign investment in Mexico; overseeing and regulating technology transfer and promoting and organizing industry and technology development. In regard to transportation statistics, SECOFI disseminates information on Mexico's merchandise trade by mode of transportation.

**Secretaría de Energía, SE**

**Ministry of Energy**

Web site: [www.energia.gob.mx/](http://www.energia.gob.mx/)

The Secretaría de Energía has, as its principal functions, the following: developing Mexico's national energy policies; promoting Mexico's use of hydrocarbon and nuclear energy, carrying out energy planning and setting the economic and social policies for the sector's state government enterprises, accomplishing and promoting research on energy costs and savings and issuing official energy standards for Mexico. In terms of transportation statistics, the SE develops and provides information on Mexico's energy balance, and other energy related indicators.

**Secretaría de Hacienda y Crédito Público, SHCP**

**Ministry of Finance and Public Credit**

Web site: [www.shcp.gob.mx/index.html](http://www.shcp.gob.mx/index.html)

The Secretaría de Hacienda y Crédito Público is responsible for projecting and coordinating national development planning with the participation of interested social groups; coordinating and developing the national statistical and geographic information services; and establishing standards and procedures for the organization, functioning and coordination of the national statistical and geographic information systems, including coordinating the information services of federal agencies and organizations. The Dirección General de Aduanas (General Directorate of Customs; or Customs Service) is an agency of the SHCP. The Dirección General de Aduanas has as its responsibilities some of the following: promoting programs and activities in order to implement legislative policies relating to Customs; preventing financial offences and crimes; developing, promoting and evaluating the specific systems, methods and procedures of the Customs Service, including the collection of statistical information on international trade.

**Secretaría de Programación y Presupuesto, SPP**

**(Former) Ministry of Planning and Budgeting**

The functions and responsibilities of the Secretaría de Programación y Presupuesto (SPP) were transferred to the Secretaría de Hacienda y Crédito Público in the first trimester of 1992.

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***Secretaría de Turismo, SECTUR***

***Ministry of Tourism***

Web site: [mexico-travel.com](http://mexico-travel.com)

SECTUR is responsible for formulating and managing policy on the development of national tourist activities; formulating and disseminating official information

concerning tourism; coordinating tourism advertising that is disseminated by various Federal Government agencies, state and municipal authorities, and social and private sectors; and compiling statistics on tourism, according to provisions set forth by the Secretaría de Hacienda y Crédito Público (Ministry of the Finance and Public Credit).

| <b>Transportation statistical subject</b>  | <b>Mexican sources for data and analysis</b>   |
|--|--|
| Country Overview                           | Instituto Nacional de Estadística, Geografía e Informática   |
| Transportation and the Economy             | Instituto Nacional de Estadística, Geografía e Informática<br>Banco de México<br>Secretaría de Hacienda y Crédito Público<br>Secretaría de Programación y Presupuesto  |
| Transportation Safety                      | Air: Secretaría de Comunicaciones y Transportes Dirección General de Aeronáutica Civil<br>Road: Instituto Nacional de Estadística, Geografía e Informática and Secretaría de Comunicaciones y Transportes (Dirección General de Policía Federal de Caminos y Puertos)<br>Pipeline: Petróleos Mexicanos<br>Transit: Instituto Nacional de Estadística, Geografía e Informática<br>Rail: Instituto Nacional de Estadística, Geografía e Informática and Secretaría de Comunicaciones y Transportes (Ferrocarriles Nacionales de México)<br>Water: Secretaría de Comunicaciones y Transportes (Coordinación General de Puertos y Marina Mercante) |
| Transportation, Energy and the Environment | Secretaría de Energía,<br>Comisión Nacional para el Ahorro de Energía<br>Comisión Reguladora de Energía<br>Secretaría de Medio Ambiente, Recursos Naturales y Pesca<br>Instituto Nacional de Ecología  |
| Domestic Freight Activity                  | Air: Secretaría de Comunicaciones y Transportes (Aeropuertos y Servicios Auxiliares and Dirección General de Aeronáutica Civil)<br>Road: Secretaría de Comunicaciones y Transportes (Dirección General de Autotransporte Federal, Caminos y Puentes Federales de Ingresos y Servicios Conexos, and Instituto Mexicano del Transporte)<br>Pipeline: Petróleos Mexicanos<br>Rail: Secretaría de Comunicaciones y Transportes (Ferrocarriles Nacionales de México)<br>Water: Secretaría de Comunicaciones y   |

|   |  |
|---|--|
| Domestic Freight Activity— <i>Continued</i>                                     | Transportes (Coordinación General de Puertos y Marina Mercante and Dirección General de Puertos)   |
| North American Merchandise Trade  | Instituto Nacional de Estadística, Geografía e Informática,<br>Secretaría de Comunicaciones y Transportes (Dirección General de Aeronáutica Civil, Coordinación General de Puertos y Marina Mercante, Ferrocarriles Nacionales de México, and Instituto Mexicano del Transporte<br>Secretaría de Hacienda y Crédito Público, Secretaría de Comercio y Fomento Industrial<br>Banco de México  |
| International Merchandise Trade Between North America and the Rest of the World | Instituto Nacional de Estadística, Geografía e Informática,<br>Secretaría de Comunicaciones y Transportes (Dirección General de Aeronáutica Civil, Coordinación General de Puertos y Marina Mercante, Ferrocarriles Nacionales de México, and Instituto Mexicano del Transporte<br>Secretaría de Hacienda y Crédito Público, Secretaría de Comercio y Fomento Industrial<br>Banco de México  |
| Domestic Passenger Travel   | Air: Secretaría de Comunicaciones y Transportes (Dirección General de Aeronáutica Civil and Instituto Mexicano del Transporte)<br>Road: Secretaría de Comunicaciones y Transportes (Dirección General de Autotransporte Federal and Caminos y Puentes Federales de Ingresos y Servicios Conexos)<br>Rail: Secretaría de Comunicaciones y Transportes (Ferrocarriles Nacionales de México)<br>Transit: Instituto Nacional de Estadística, Geografía e Informática<br>Water: Secretaría de Comunicaciones y Transportes (Coordinación General de Puertos y Marina Mercante and Dirección General de Puertos) |
| North American Passenger Travel   | Banco de México<br>Instituto Nacional de Migración<br>Instituto Nacional de Estadística, Geografía e Informática<br>Secretaría de Turismo<br>Secretaría de Comunicaciones y Transportes  |

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International Passenger Travel  
Between North America and the  
Rest of the World

Banco de México  
Instituto Nacional de Migración  
Instituto Nacional de Estadística, Geografía e  
Informática  
Secretaría de Turismo  
Secretaría de Comunicaciones y Transportes

Transportation Infrastructure

Air: Secretaría de Comunicaciones y Transportes  
(Dirección General de Aeronáutica Civil)  
Road: Secretaría de Comunicaciones y Transportes  
(Caminos y Puentes Federales de Ingresos y  
Servicios Conexos and Dirección General de  
Evaluación)

Pipeline: Petróleos Mexicanos

Transit: Instituto Nacional de Estadística,  
Geografía e Informática and various local  
transit authorities

Rail: Secretaría de Comunicaciones y Transportes  
(Ferrocarriles Nacionales de México)

Water: Secretaría de Comunicaciones y Transportes  
(Coordinación General de Puertos y Marina  
Mercante and Dirección General de Puertos)

Transportation Vehicles

Air: Secretaría de Comunicaciones y Transportes  
(Aeropuertos y Servicios Auxiliares and Dirección  
General de Aeronáutica Civil)

Road: Instituto Nacional de Estadística, Geografía e  
Informática and Secretaría de Comunicaciones y  
Transportes (Instituto Mexicano del Transporte)

Transit: Instituto Nacional de Estadística, Geografía e  
Informática and various local transit authorities

Rail: Secretaría de Comunicaciones y Transportes  
(Ferrocarriles Nacionales de México)

Water: Secretaría de Comunicaciones y Transportes  
(Coordinación General de Puertos y Marina  
Mercante and Dirección General de Puertos)

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## **OVERVIEW OF TRANSPORTATION STATISTICS IN THE UNITED STATES**

### **Overview of the U.S. Statistical System**

The U.S. statistical system is highly decentralized. Responsibility for producing federal statistics is divided among approximately 70 agencies. Eleven agencies, located in 9 departments, have statistical activities (collecting, analyzing, producing and disseminating statistical data) as their primary mission. These agencies are the Bureau of Economic Analysis and the U.S. Census Bureau at the Department of Commerce, the Bureau of Labor Statistics at the Department of Labor, the Statistics of Income Division at the Department of Treasury, the Energy Information Administration at the Department of Energy, the National Center of Health Statistics at the Department of Health and Human Services, the Bureau of Justice Statistics at the Department of Justice, the National Center for Education Statistics at the Department of Education, the Economic Research Service and the National Agricultural Statistics Service at the Department of Agriculture and the Bureau of Transportation Statistics at the Department of Transportation. Each of these agencies maintains its own separate budget. In addition, there are approximately 60 other agencies that also conduct statistical activities, although statistics are not the primary mission of these agencies. Oversight and coordination of the U.S. statistical system is the responsibility of the Office of Management and Budget, Office of Information and Regulatory Affairs (OMB/OIRA).

### **Specific Sources of U.S. Transportation and Transportation Related Data and Information**

The following section discusses the roles and

responsibilities of selected U.S. federal agencies along with other organizations that plan, collect, coordinate, develop and maintain transportation and transportation related data and information. For some of these organizations, transportation statistics are a primary focus. For others, it is one of many activities, and for some, it represents a by-product of primary functions. This list represents many of the U.S. sources used in this publication, but should not be viewed as exhaustive. A brief description of each organization's general mission and functions is provided as well as its specific data activities. However, detailed information on agency data activities is not described extensively here. Additional information on specific surveys, methodologies, dissemination and other items can be found at the web sites of individual organizations described below. Some transportation data and information from nonfederal sources also are discussed here.

### ***U.S. Department of Transportation (USDOT)***

Web site: [www.dot.gov/](http://www.dot.gov/)

The mission of the Department of Transportation is to serve the United States by ensuring a fast, safe, efficient, accessible and convenient transportation system that meets U.S. vital national interests and enhances the quality of life of the public. The Department has five strategic goals: (1) Safety (promote the public health and safety by working toward the elimination of transportation related deaths and injuries), (2) Mobility (shape an accessible, affordable and reliable transportation system for all people and goods), (3) Economic Growth (support a transportation system that sustains U.S. economic growth), (4) Human and Natural Environment (protect and enhance communities and the natural environment affected by transportation) and

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(5) National Security (ensure the security of the transportation system for the movement of people and goods). The DOT consists of the Office of the Secretary and twelve individual operating administrations. These include the Bureau of Transportation Statistics, US Coast Guard, the Federal Aviation Administration, the Federal Highway Administration, the Federal Railroad Administration, the Federal Transit Administration, the Maritime Administration, National Highway Traffic Safety Administration, the Research and Special Programs Administration, the Saint Lawrence Seaway Development Corporation, the Surface Transportation Board, the Transportation Administrative Services Center and the Federal Motor Carrier Safety Administration (as of January 2000).

#### Bureau of Transportation Statistics

Web site: [www.bts.gov/](http://www.bts.gov/)

The mission of the Bureau of Transportation Statistics (BTS) is the development of transportation data, information and analysis of high quality and to advance their effective use in both public and private decision making. These decisions focus on transportation investment, policies and planning decisions in the areas of safety, economic activity, mobility, national security and the human and natural environment, which are also the overarching strategic goals of the USDOT. BTS compiles, analyzes and makes accessible information about the nation's transportation systems; collects information on various aspects of transportation; and enhances the quality and effectiveness of the USDOT's statistical programs through research, the development of guidelines and the promotion of improvements in data acquisition and use. BTS customers include the US Congress, federal, state and local governments; transportation-related associations; private

business and industry; universities and the general public. BTS measures its performance in terms of specific data and information outcomes, including relevance, quality, timeliness, comparability, completeness and utility.

BTS' largest data collection programs are the Commodity Flow Survey (CFS) (conducted jointly with the Census Bureau) and the National Personal Transportation Survey/American Travel Survey (NPTS/ATS, conducted jointly with the Federal Highway Administration), to identify where freight and people go by all modes of transportation. BTS also sponsors the processing of transportation related data for U.S. merchandise land trade and then analyzes and disseminates this information. In conjunction with the Bureau of Economic Analysis at the Department of Commerce, BTS has developed the Transportation Satellite Accounts (TSAs) for the United States, which provide a way to measure both in-house and for-hire transportation services contribution to gross domestic product (GDP) in a framework consistent with the national accounts. In addition, BTS' Office of Airline Information (OAI) collects, maintains and analyzes financial, market and performance data of the airline industry. BTS also manages the National Transportation Library and leads the Federal Government's effort in developing geo-spatial data for transportation. BTS also is developing the Intermodal Transportation Data Base (ITDB) that will link key safety and other data sets for multimodal analysis through web-based technologies.

#### Federal Aviation Administration

Web site: [www.faa.gov/](http://www.faa.gov/)

The primary function of the Federal Aviation Administration (FAA) is to foster the development and safety of aviation in the

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United States. FAA maintains a diverse set of data that supports critical activities in safety regulation; airspace and air traffic management; management of air navigation facilities; research, engineering and development; testing and evaluation of aviation systems; airport programs; and registration of aircraft.

#### Federal Highway Administration

Web site: [www.fhwa.dot.gov/](http://www.fhwa.dot.gov/)

The Federal Highway Administration (FHWA) directly administers a number of road transportation activities, including standards development, research and technology, training, technical assistance, highway access to federally-owned and Indian lands and commercial vehicle safety enforcement. FHWA also has a significant role, working through partnerships, programs, policies and the allocation of resources, in facilitating the strategic development and maintenance of state and local roads and intermodal transportation systems. FHWA statistical activities include the collection, analysis and dissemination of data on the U.S. road system, infrastructure financing, vehicle fuel consumption, vehicle registrations, driver registrations and characteristics of local travel.

#### Federal Motor Carrier Safety Administration

Web site: [www.fmcsa.dot.gov/](http://www.fmcsa.dot.gov/)

The mission of the Federal Motor Carrier Safety Administration (FMCSA) is the issuance, administration and enforcement of federal motor carrier safety regulations and the drug and alcohol testing requirements under U.S. hazardous materials regulations. FMCSA's goal is to achieve continuous safety improvements in the U.S. highway system, intermodal connections and motor carrier operations through the development and promotion of data-driven, analysis-based,

and innovative programs. FMCSA began as a USDOT operating administration in January 2000. FMCSA collects, analyzes and disseminates motor carrier safety and related data.

#### Federal Railroad Administration

Web site: [www.fra.dot.gov/](http://www.fra.dot.gov/)

The mission of the Federal Railroad Administration (FRA) is to promulgate and enforce rail safety regulations, administer railroad financial assistance programs, conduct research and development in support of improved railroad safety and national rail transportation policy and facilitate the development of new and improved rail technology. FRA collects, analyzes and disseminates data on the U.S. railroad system, including traffic, safety and accident reports, as well as information on grade crossings and inspections.

#### Federal Transit Administration

Web site: [www.fta.dot.gov/](http://www.fta.dot.gov/)

The mission of the Federal Transit Administration (FTA) is to assist public and private transit companies in the development of improved transit systems, facilities and equipment, and to provide assistance to state and local governments in financing these systems and facilities. The FTA collects, analyzes and disseminates operating and financial data on transit systems and services in the United States.

#### Maritime Administration

Web site: [www.marad.dot.gov/](http://www.marad.dot.gov/)

The mission of the Maritime Administration (MARAD) is to promote the development, operation and maintenance of the U.S. Merchant Marine. MARAD also seeks to ensure that the United States enjoys adequate shipbuilding and repair service, efficient ports, effective intermodal water and land

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transportation systems, and reserve shipping capacity in time of national emergency. MARAD collects, analyzes, maintains and disseminates data on foreign and domestic trade, vessel characteristics and itineraries, port facilities, shipbuilding and repair, ship values, financial reports and operating expenses, shipping activities and maritime employment.

National Highway Traffic Safety Administration

Web site: [www.nhtsa.dot.gov/](http://www.nhtsa.dot.gov/)

The mission of the National Highway Traffic Safety Administration (NHTSA) is to improve the safety of motor vehicle transportation by identifying and eliminating motor vehicle and road safety problems. NHTSA collects, analyzes and disseminates data and information on road and vehicle safety, including motor vehicle-related crashes, injuries and fatalities and the economic costs of these.

Research and Special Programs Administration

Web site: [www.rspa.dot.gov/](http://www.rspa.dot.gov/)

The mission of the Research and Special Programs Administration (RSPA) is to serve as a long-range research and technical development arm of the USDOT and to conduct special programs. Statistical activities include the collection of data on the movement of hazardous materials and the safety of liquid and natural gas pipelines.

Saint Lawrence Seaway Development Corporation

Web site: [www.dot.gov/slsdc/](http://www.dot.gov/slsdc/)

The Saint Lawrence Seaway Development Corporation (SLSDC) is responsible for operating and maintaining the St. Lawrence

Seaway in cooperation with Canada, and for developing international trade throughout the Great Lakes Seaway system. Statistical activities include the analysis and dissemination of data specific to the St. Lawrence Seaway.

Surface Transportation Board

Web site: [www.stb.dot.gov/](http://www.stb.dot.gov/)

The Surface Transportation Board (STB or Board) is a bipartisan, independent, adjudicatory body, housed within the USDOT. The Board was established following the termination of the Interstate Commerce Commission (ICC) in 1995, and assumed certain ICC regulatory functions. These included broad economic oversight of railroads, and more limited oversight of pipeline carriers, intercity bus carriers, water carriers engaged in noncontiguous domestic trade, household goods carriers, and certain types of motor carriers. The STB collects, maintains and analyzes economic, financial and employment data on Class I railroads in the U.S.

U.S. Coast Guard

Web site: [www.uscg.mil/](http://www.uscg.mil/)

The U.S. Coast Guard (USCG) is one of five branches of the U.S. Armed Forces, and falls under the jurisdiction of DOT. The USCG is the country's oldest continuous seagoing service with responsibilities that include search and rescue operations, maritime law enforcement, navigation aids, icebreaking, environmental protection, port security and military readiness. The USCG collects, maintains and analyzes data on recreational boating safety; commercial vessel casualties; merchant marine licensees; USCG inspections of foreign and U.S. vessels, offshore and port facilities; USCG search and rescue performance; and pollution incidents that occur within navigable waters of the United States.

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### ***U.S. Department of Commerce (USDOC)***

Web site: [www.doc.gov/](http://www.doc.gov/)

The Department of Commerce promotes job creation, economic growth, sustainable development and improved living standards by working in partnership with business, universities, communities and workers. Specifically, the Commerce Department facilitates technology that is used in the workplace and home every day; supports the development, gathering and transmitting of information essential to competitive business; promotes the diversity of companies and goods; supports environmental and economic health for communities; and conducts the constitutionally mandated decennial census.

#### U.S. Census Bureau

Web site: [www.census.gov/](http://www.census.gov/)

The U.S. Census Bureau (Census) is responsible for collecting, tabulating and publishing a variety of statistical data about the United States. Census' responsibilities include the decennial census of population and housing; quinquennial censuses of state and local governments and domestic industries; special censuses done at the request and expense of states and localities, and statistical compilations of U.S. foreign trade. Among its major transportation data activities are the Census of Transportation, the Vehicle Inventory and Use Survey (VIUS), and the Transportation Annual Survey (TAS). The Census of Transportation is conducted every 5 years (years ending in 7 and 2), and collects financial and operational data on domestic establishments that provide passenger and freight transportation. The VIUS (formerly known as the Truck Inventory and Use Survey, or TIUS) measures the physical and operational characteristics of the U.S. private and commercial trucking fleet. The TAS collects data on revenue, expenses and

vehicle fleet inventories for commercial motor freight transportation and public warehousing service industries. In addition, Census jointly conducts the Commodity Flow Survey with the Bureau of Transportation Statistics at DOT.

#### Bureau of Economic Analysis

Web site: [www.bea.doc.gov/](http://www.bea.doc.gov/)

The Bureau of Economic Analysis (BEA) is responsible for preparing, developing and interpreting sets of economic accounts that include national income and wealth accounts, state and regional income and product accounts and international trade and balance of payment accounts. In conjunction with the Bureau of Transportation Statistics, BEA helped develop the Transportation Satellite Account (TSA).

#### International Trade Administration

Web site: [www.ita.doc.gov/](http://www.ita.doc.gov/)

The International Trade Administration (ITA) disseminates data and reports on U.S. merchandise and service trade, production prices and foreign direct investment in the United States. In addition, the Tourism Industries Office at ITA collects and maintains data on international travel to and from the United States.

### **Other U.S. Federal Agencies**

#### ***Bureau of Labor Statistics, U.S. Department of Labor***

Web site: [www.stats.bls.gov/](http://www.stats.bls.gov/)

The Bureau of Labor Statistics (BLS) is responsible for collecting, analyzing and disseminating data on employment, prices and consumer expenditures, compensation and working conditions, productivity and employment projections. This includes data for the U.S. transportation sector.

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**Energy Information Administration, U.S. Department of Energy**

Web site: [www.eia.doe.gov/](http://www.eia.doe.gov/)

The Energy Information Administration (EIA) is responsible for collecting, processing and publishing energy supply and demand data and information on energy consumption, distribution and related technologies. EIA develops analyses on energy trends and their micro- and macroeconomic effects. Coverage includes data on coal, petroleum, natural gas, and electric and nuclear energy.

**Environmental Protection Agency**

Web site: [www.epa.gov/](http://www.epa.gov/)

The Environmental Protection Agency (EPA) monitors the quality of the air and drinking, surface and ground water, ecosystem status and the introduction of toxic or hazardous substances into the environment. It conducts research and studies to provide baseline data and to evaluate and support environmental monitoring systems. Established in 1997, the Center for Environmental Information and Statistics (CEIS) is EPA's one-stop source of data and information on environmental quality and trends.

**National Transportation Safety Board**

Web site: [www.ntsb.gov/](http://www.ntsb.gov/)

The National Transportation Safety Board (NTSB) is an independent federal agency charged by the U.S. Congress with investigating every civil aviation accident in the United States and significant accidents in the railroad, highway, marine and pipeline modes. It also issues safety recommendations aimed at preventing future accidents. The NTSB compiles, analyzes and disseminates data and information on transportation accidents that it investigates.

**U.S. Army Corp of Engineers, U.S. Department of Defense**

Web site: [www.usace.army.mil/](http://www.usace.army.mil/)

The U.S. Army Corps of Engineers (USACE) is responsible for the operation and maintenance of the U.S. waterway system to ensure efficient and safe passage of commercial and recreational vessels. The USACE's Navigation Data Center (NDC) is responsible for establishing and maintaining a variety of navigation-oriented databases. These include databases of foreign and domestic waterborne commerce, domestic commercial vessels, port facilities, lock facilities and operations and navigation dredging projects.

**U.S. Customs Service, U.S. Department of Treasury**

Web site: [www.customs.ustreas.gov/](http://www.customs.ustreas.gov/)

The U. S. Customs Service (Customs) ensures that all imports and exports comply with U.S. laws and regulations. Customs collects and verifies tariff and trade data, which the Census Bureau tabulates, analyzes and disseminates. In addition, Customs collects and maintains border crossing data for passengers, vehicles and vessels entering the United States.

**Nongovernment Organizations and Associations**

This list represents selected nongovernmental organizations and associations that were used as U.S. resources for this publication. This list should *not* be viewed as an exhaustive list of nongovernmental organizations and associations that maintain and analyze transportation and transportation related data for the United States. A brief description of each organization's general mission and functions is provided as well as its specific data activities.

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**Association of American Railroads**

Web site: [www.aar.org/](http://www.aar.org/)

The Association of American Railroads (AAR) represents North America's major freight railroads and Amtrak. Among its activities, AAR compiles and disseminates a variety of data on railroads, including its annual *Railroad Fact* book, which provides financial and operating statistics for Class I railroads in the United States.

**American Public Transit Association**

Web site: [www.apta.com/](http://www.apta.com/)

The American Public Transit Association (APTA) represent operators of bus, rapid transit and commuter rail systems, and the organization is responsible for planning, designing, constructing, financing and operating transit systems. Among its activities, APTA compiles and publishes transit data, including its annual *Transit Fact Book*.

**Association of Oil Pipe Lines**

Telephone: 202-408-7970

The Association of Oil Pipe Lines is an unincorporated nonprofit organization, which among other activities, assembles, maintains and disseminates current information about the U.S. oil pipeline industry.

**American Gas Association**

Web site: [www.aga.com/](http://www.aga.com/)

The American Gas Association (AGA) represents 181 local natural gas utilities that deliver gas to 54 million homes and businesses in all 50 states. Among its activities, AGA acts as a clearinghouse for natural gas energy information.

| <b>Transportation statistical subject</b>  | <b>U.S. sources for data and analysis</b>  |
|--|--|
| Country Overview Data                      | Population and Area: U.S. Census Bureau<br>Labor Force: Bureau of Labor Statistics<br>Gross Domestic Product: Bureau of Economic Analysis  |
| Transportation and the Economy             | Bureau of Transportation Statistics<br>U.S. Census Bureau<br>Bureau of Economic Analysis<br>Bureau of Labor Statistics   |
| Transportation Safety                      | Air: Federal Aviation Administration<br>Water: Maritime Administration and U.S. Coast Guard<br>Road Motor Vehicles: National Highway Traffic Safety Administration and Federal Highway Administration<br>Pipeline: Research and Special Projects Administration<br>Transit: Federal Transit Administration<br>Rail: Federal Railroad Administration<br>Multimodal Analysis: Bureau of Transportation Statistics<br>Multimodal Investigations: National Transportation Safety Board |
| Transportation, Energy and the Environment | Energy: Bureau of Transportation Statistics<br>Energy: Other U.S. DOT Modal Administrations<br>Energy: Energy Information Agency<br>Environment: Environmental Protection Agency<br>Environment: Bureau of Transportation Statistics   |
| Domestic Freight Activity                  | Air: Bureau of Transportation Statistics<br>Water: Army Corps of Engineers<br>Road: Bureau of Transportation Statistics and U.S. Census Bureau<br>Rail: Federal Railroad Administration<br>Multimodal: Bureau of Transportation Statistics and U.S. Census Bureau  |
| North American Merchandise Trade           | Air: Bureau of Transportation Statistics and U.S. Census Bureau<br>Road: Bureau of Transportation Statistics<br>Rail: Bureau of Transportation Statistics<br>Pipeline: Bureau of Transportation Statistics   |

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North American Merchandise Trade—*Continued*

International Merchandise Trade  
Between North America and the  
Rest of the World

Domestic Passenger Travel

North American Passenger Travel

International Passenger Travel Between  
North America and the Rest of the World

Transportation Infrastructure

Transportation Vehicles

Water: Army Corps of Engineers and Maritime  
Administration

Land Border Crossing: Customs Service

Air: Bureau of Transportation Statistics and  
U.S. Census Bureau

Road: Bureau of Transportation Statistics

Rail: Bureau of Transportation Statistics

Pipeline: Bureau of Transportation Statistics

Water: Army Corps of Engineers and Maritime  
Administration

Air: Bureau of Transportation Statistics

Road: Federal Highway Administration

Transit: Federal Transit Administration and  
American Public Transit Association

Rail: Federal Railroad Administration,  
Amtrak, and American Public Transit  
Association

Long Distance Travel: Bureau of  
Transportation Statistics

Air: Bureau of Transportation Statistics

Long Distance Travel: Bureau of  
Transportation Statistics

Land Border Crossing: Customs Service

Air: Bureau of Transportation Statistics and  
International Trade Administration

Long Distance Travel: Bureau of  
Transportation Statistics

Water: Army Corps of Engineers

Road: Federal Highway Administration

Transit: Federal Transit Administration and  
American Public Transit Association

Rail: Federal Railroad Administration,  
Amtrak, and American Public Transit  
Association

Air: Federal Aviation Administration and  
Bureau of Transportation Statistics

Water: Maritime Administration, U.S.  
Coast Guard and Army Corps of  
Engineers

Road: Federal Highway Administration

Transit: Federal Transit Administration  
and American Public Transit Association

Rail: Federal Railroad Administration,  
Amtrak, and American Public Transit  
Association



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a p p e n d i x B

Additional Sources  
and Technical Notes



# appendix B

## Additional Sources and Technical Notes

### SECTION 1: COUNTRY OVERVIEW

**Table 1-1**  
**National Population and Labor Force**

#### Canada

National population and labor force: Statistics Canada *Annual Demographics Statistics, Catalogue no. 91-213-XPB*. (Ottawa, Ont.: various years).

Statistics Canada Special tabulations. (Ottawa, Ont.: 1998).

Urban population: Statistics Canada 1996 Census of Population. *A national overview-population and dwelling counts, Catalogue no. 93-357-XPB*. (Ottawa, Ont.: 1997).

*National population:* National population data in this table are based on postcensal population estimates. The estimates are based on data for each province and territory where the base population used to derive postcensal population estimates is the 1991 census count of population by age, sex and marital status adjusted to July 1, 1991, and for net census undercoverage. The postcensal estimates by age, sex and marital status are obtained by the component method. The demographic events that occurred between July 1, 1991, and the reference date of the estimate are added to or subtracted from the July 1, 1991, population. Demographic events can be divided into two groups according to the type of data used: those that data are readily available (births, deaths, marriages, divorces and immigration)

and events that have to be estimated (inter-provincial migration, return of Canadians, emigration, net changes in nonpermanent residents and new widowhood).

*Urban percentages:* Canadian urban and rural population percentages are based on 1996 census counts. Urban and rural data are based on the following definitions. Canadian urban areas have minimum population concentrations of 1,000 and a population density of at least 400 persons per square kilometer, based on the previous census population counts. All territory outside of urban areas is considered rural. Taken together, urban and rural areas cover all of Canada.

*Labor force:* Total labor force refers to the number of Canadians over the age of 15 who are in the labor force, whether they are employed or unemployed. Note that not everyone in the 15-and-over age group is in the labor force. See notes under Tables 2-4 and 2-5 for more detail.

#### Mexico

National and urban population: Instituto Nacional de Estadística, Geografía e Informática. *XI Censo General de Población y Vivienda, 1990. Estados Unidos Mexicanos. Perfil Sociodemográfico*. (Aguascalientes, Ags.: 1992).

Instituto Nacional de Estadística, Geografía e Informática. *Conteo de Población y Vivienda, 1995. Estados Unidos Mexicanos. Resultados Definitivos. Tabulados Básicos*. (Aguascalientes, Ags.: 1996).

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Instituto Nacional de Estadística, Geografía e Informática. *Conteo de Población y Vivienda, 1995. Estados Unidos Mexicanos. Perfil Sociodemográfico*. (Aguascalientes, Ags.: 1997).

Instituto Nacional de Estadística, Geografía e Informática. *Encuesta Nacional de la Dinámica Demográfica, 1997*. (Aguascalientes, Ags.: 1997).

**Labor force:** Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. *Encuesta Nacional de Empleo, 1991, 1995 and 1996*. (Aguascalientes, Ags.: various years).

**National population:** The national population is comprised of Mexican citizens, noncitizen residents who were living in Mexico at the time the census was taken and Mexicans in the diplomatic service. For 1997, data were taken from the *Encuesta Nacional de la Dinámica Demográfica (National Survey on Demographic Dynamics)*. For 1990, 1995 and 1997, there were 0.5, 0.2 and 0.03 million residents who did not give their age. These are included in the category “over 65 years of age.”

**Urban percentages:** The urban population is based on areas with more than 2,500 inhabitants.

**Population density:** Population density was estimated from the country’s surface area of 1,967,183 square kilometers, using as the source the *XI Censo de Población y Vivienda, 1990 (XI Population and Household Census, 1990)*.

**Labor force:** Labor force data were estimated from the *Encuesta Nacional de Empleo (National Employment Survey)* for the second quarters of 1991, 1995 and 1996. The estimate was based on the economically active

population, defined as anyone of age 12 or older (*Población Económicamente Activa*, or PEA). The percentage of labor force was calculated using the total population in 1991, 1995 and 1996. The survey, *Encuesta Nacional de Empleo*, is a joint effort of the Instituto Nacional de Estadística, Geografía e Informática and the Secretaría del Trabajo y Previsión Social (Ministry of Labor and Social Welfare) with coverage throughout Mexico.

Labor force data in Table 1-1 differ from labor force data in Table 2-4 because the two tables use different sources. The data in Table 2-4 are derived from estimates of the National Account System of Mexico, and are the number of positions considered as necessary for production. See notes under Table 2-4 for a more complete explanation.

### **United States**

**National population and age structure:** U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States 1998*. (Washington, DC: 1998). Table Nos. 12 and 14.

**Urban population:** U.S. Department of Commerce. U.S. Census Bureau. *Estimates of the Population of Metropolitan Areas: Annual Time Series, July 1, 1991, to July 1, 1996*. (Washington, DC: 1997).

**Population density:** U.S. Department of Commerce. U.S. Census Bureau. *State Population Estimates: Annual Time Series, July 1, 1990, to July 1, 1998*. (Washington, DC: 1998).

**Labor force:** U.S. Department of Commerce. U.S. Census Bureau and the Bureau of Labor Statistics. *Current Population Survey*. (Washington, DC: 1998).

**National population:** National population figures for the U.S. represent the resident popu-

lation based on the 1990 Census of Population and Housing. Resident population includes all people who usually live within the United States. This excludes the U.S. Armed Forces overseas and civilian U.S. citizens whose usual place of residence is outside the United States. Data include Puerto Rico and U.S. Territories. The following formula was applied to update each group for 1995 and 1996: the 1990 enumeration of resident population, plus births to U.S. resident women, minus deaths to U.S. residents, plus net international migration, and plus net movement of U.S. Armed Forces and civilian citizens to the United States.

*Urban percentages:* Urban percentages are based on U.S. definitions of these areas. In general, an urbanized area comprises one or more places (“central place”) and the adjacent densely settled surrounding territory (“urban fringe”) that together have a minimum of 50,000 persons. Data include Puerto Rico and U.S. territories. The data for 1990 are revised 1990 decennial census figures. The data for 1995 and 1996 are population estimates for those years. These aforementioned estimates incorporate revisions of estimates from previous years and the results of special and test censuses conducted by the U.S. Census Bureau.

*Labor force:* Labor force data represent the U.S. civilian labor force. The civilian labor force includes all U.S. citizens aged 16 and older who have jobs and also includes those without jobs but who are available for work and looking for work. This figure excludes those who work for the U.S. military. The civilian labor force data include Puerto Rico and U.S. Territories.

## **Tables 1-1a, 1-1b and 1-1c Top Population Centers**

### **Canada**

Statistics Canada. *Annual Demographics Statistics, Catalogue no. 91-213-XPB*. (Ottawa, Ont.: 1998).

*Metropolitan areas:* The Canadian Census Metropolitan Area (CMA) is a very large urban area (known as an “urban core”) plus adjacent urban and rural areas (known as “urban and rural fringes”) that have a high degree of social and economic integration with the urban core. A CMA has an urban core population of at least 100,000, based on the previous census. Once an area becomes a CMA, it is retained as a CMA even if the population of its urban core declines below 100,000. All CMAs are subdivided into census tracts. A CMA may be consolidated with adjacent census agglomerations (CAs) if they are socially and economically integrated.

### **Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Estadísticas del Medio Ambiente, 1997*. (Aguascalientes, Ags.: 1998).

*Metropolitan areas:* The table lists the number of people living in the most densely populated areas; these include metropolitan areas, metropolitan zones and cities. By definition a metropolitan area (MA) is formed when two or more urban sites or cities (located in different municipalities or states) grow to the point where they have physically merged, to form a continuous population concentration of 100,000 inhabitants or more. A metropolitan zone (MZ) includes the MA, plus the municipalities to which the components of the MA belong. The other geo-

graphical locations in Table 1-1b are cities with populations of 15,000 or more. They do not meet the definition of Metropolitan Zones or Areas.

### **United States**

U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States 1998*. (Washington, DC: 1998).

*Metropolitan areas:* The United States defines Metropolitan Statistical Areas (MSAs) as a core area with a large population (usually 50,000 or more) together with adjacent communities having a high degree of social and economic integration. If an MSA has a population of more than 1 million, with separate component areas, it is designated a Consolidated Metropolitan Statistical Area (CMSA) with the components designated as Primary Metropolitan Statistical Areas (PMSA). For instance the Los Angeles-Riverside-Orange County, CA CMSA is made up of the Los-Angeles-Long Beach PMSA, the Orange County PMSA, the Riverside-San Bernardino PMSA and the Ventura PMSA.

**Table 1-2**  
**Area**

### **Canada**

Natural Resources Canada. GeoAccess Division. (Ottawa, Ont.: 1998).

*Land and water area:* The official source of Canada's land and water area is the GeoAccess Division of Canada Centre for Remote Sensing in Natural Resources Canada (NRCAN). Area data were calculated in 1981 using planimeters on large-scale maps (scale of 1: 250 000). GeoAccess produces the *National Atlas of Canada*, which contains various types of maps showing the extent of Canada's land and water area. Water data in-

clude inland waters, Great Lakes waters and coastal waters, but do not include offshore waters such as fishing zones, internal salt waters and territorial seas. (Canada has legal jurisdiction over a very large area of offshore waters. The Canadian Hydrographic Service of Fisheries and Oceans Canada has determined the total extent of these waters to be 5.9 million square kilometers.) Canada is the second largest country in the world, with a total area (land plus freshwater) of 10 million square kilometers. Located primarily above the 49th parallel of latitude, Canada borders on three oceans, the Atlantic to the east, Arctic to the north and Pacific to the west.

### **Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Geografía. (Aguascalientes, Ags.: 1998).

*Land and water area:* Data come from semi-automatic digital measurements, which provide accurate values for land area. Water area represents inland waters (such as ponds, bays, inlets, lagoons, marshes, etc.), coastal waters (provided their geography conforms to the International Agreement on Maritime Territory (inlet less than 24 nautical miles; i.e., less than 44.448 km)) and territorial seas (waters within 12 nautical miles of the Mexican shoreline). Data for water area also include islands (5,127 square km) and maritime territory (209,000 square km).

### **United States**

U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States 1998*. (Washington, DC: 1998). Table No. 387.

*Land and water area:* U.S. land and water areas are defined by the TIGER (Topologically Integrated Geographic Encoding and Refer-

encing) database maintained at the Census Bureau. The water data represent the total of four major water classifications: inland water (all lakes ponds, rivers, streams, creeks or similar bodies of water with the exception of the Great Lakes); coastal water (major bays and nonenclosed areas); territorial seas (water located within 3-nautical miles of the U.S. shoreline); and Great Lakes water (includes the five Great Lakes, Lake St. Clair and the St. Lawrence Seaway). Area data for U.S. territories can be found in Table 387 of the 1998 *Statistical Abstract of the United States*.

**Table 1-3**  
**Gross Domestic Product by Industry**

(Current U.S. dollars)

**All Countries**

*Gross domestic product:* Gross domestic product (GDP) is an aggregate measure of output of goods and services produced by factors, including land, labor and capital, located in a particular country. As the most widely-used aggregate indicator of the size of a country's economy, GDP measures the total value of goods and services produced in a given period minus the total cost of goods and services used as intermediate inputs. For an industry, the difference between the total output and the total intermediate input is the industry's total value added. Therefore, GDP is the sum of all industries' value added or GDP by industry. GDP by industry shows how much of the total GDP was created in each industry.

There are several different valuation approaches to measuring the GDP by industry. For example, factor cost valuation represents the earnings of the factors of production and is measured by the costs of labor (wages and

salaries, supplementary labor income) and capital inputs (mixed income and other operating surplus) in the production process. The market price approach brings the valuation of production up to the "market price" level. In order to derive the measure of GDP at market prices for the total economy, net indirect taxes (i.e., indirect taxes less subsidies) should also be added to the measure of GDP at factor cost as they are part of the market price of goods and services. The indirect taxes include taxes on production such as payroll and property taxes and taxes on products such as sales tax. In Table 1-3, the United States and Mexico estimates are based on market price evaluation. The Canadian estimates are based on an evaluation, which includes net indirect taxes paid on production and sales taxes paid by industries. The difference is that sales taxes collected by industries but paid by end users are not included in the Canadian estimates.

The industry categories included in Table 1-3 are broad aggregates for economic activity by industry. The industry categories included in Table 1-3 are a modified version of the 1987, U.S. Standard Industry Classification (S.I.C.). At this level, these categories are generally comparable across the three countries. However, there are instances where modifications and recategorization of individual country data have occurred. These are explained in the individual country notes.

In general, however, the following definitions, of these industries are as follows: *Agriculture, forestry and fishing* includes agricultural and related service industries, fishing and trapping industries and logging and forestry industries. *Mining* includes mining, quarrying and oil well industries. *Construction* includes construction industries. *Manufacturing* includes manufacturing industries. *Com-*

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*munications* include communication and related service industries. *Utilities* include electricity, natural gas, water, sanitation and other utility services. *Wholesale trade* includes wholesale trade industries. *Retail trade* includes retail trade industries. *Finance, insurance and real estate* includes finance, insurance and real estate industries. *Services* includes business service industries, education service industries, health and social service industries, accommodation, food and beverage industries, other service industries and nonprofit institutions serving households.

The industry subcategories under *Transportation* are based on the following definitions. *Railroad* transportation includes rail transportation and related service industries. *Local and Interurban Passenger* includes mass transit transportation (both transit rail and bus), interurban and rural transit, taxicab, school and other bus operations, and other related industries. *Trucking, Warehousing and Storage* include truck transportation industries and other storage and warehousing industries. *Water* includes water transportation and related service industries. *Air* includes air transportation and related service industries. *Pipelines, excluding natural gas* includes crude oil and other pipeline transport industries. *Transportation services* includes other incidental service industries such as services of travel agencies, tour operators, freight forwarders and brokers, rental services and other miscellaneous transportation services.

### **Canada**

Statistics Canada. Input-Output Division. Special tabulations. (Ottawa, Ont.: 1999).

In order to derive the measure of Canada's GDP by industry cost for the total Canadian

economy, net indirect taxes (i.e., indirect taxes less subsidies) paid by industries were added to the measure of GDP at factor cost. The "net indirect taxes," in this case, indicate that subsidies have been subtracted from the indirect tax total.

The industry categories included in Table 1-3 are broad aggregates for economic activity by industry. The industry categories included in Table 1-3 are a modified version of the 1987, U.S. Standard Industry Classification (S.I.C.). Canadian data included in Table 1-3 are, for the most part, based on Canada's 1980 Standard Industrial Classification (SIC-80) with the one exception being the category of government, which includes all nonprofit government-funded activity (regardless of industrial activity). Agriculture, forestry and fishing include: agricultural and related services industries, fishing and trapping industries and logging and forestry industries. Transportation industries include related services for railroad, water, air and transportation services. Trucking, warehousing and storage includes other warehousing and storage industries. Utilities include natural gas pipeline transport. Services include: business service industries, accommodations, food and beverage industries, other service industries and private and nonprofit institutions servicing households.

### **Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Aguascalientes, Agu.: 1997).

The base year for the *Sistema de Cuentas Nacionales de México* (Mexico's National Account System) is 1993, based on the United Nation's framework for national accounts. This

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framework resulted from a joint effort of the European States Commission (EUROSTAT), the International Monetary Fund (IMF), the Organization for Economic Cooperation and Development (OECD) and the World Bank. The classification scheme used in Table 1-3 does not match exactly with that of the *Sistema de Cuentas Nacionales de México*, since some adjustments were made for comparability purpose across the three countries. The following adjustments were made:

Transportation in this table is based on the industry category of “Transportation, Warehousing and Communications” in the *Sistema de Cuentas Nacionales de México*. (Specifically, “transportation, warehousing and communications” is considered Gran Division 7, or GD 7 in the *Sistema de Cuentas Nacionales de México*.) However, for Table 1-3, the Transportation and Warehousing categories have been separated from Communications. Under the category “Transportation Services” in Table 1-3, the following were included: customs agencies, travel agencies, parking lots, hauling and weighing services and other transportation related services such as management of ports, airports and bus stations, coordination of roads and toll booths, control of radar and flight stations and the unloading and stowing of goods. The data for the category “Utilities” in Table 1-3 are based on Mexico’s Gran Division 5 (GD 5) in its *Sistema de Cuentas Nacionales de México*, and include the following industries: electricity, natural gas and water. The data for the category “Services” in Table 1-3 are based on Mexico’s Gran Division 6 (GD 6) in its *Sistema de Cuentas Nacionales de México*, and include the following industries: professional services such as schooling, health care, recreational and others. Restaurants and hotels

also were included in the data for the “Services” category in Table 1-3. In Mexico’s *Sistema de Cuentas Nacionales de México*, restaurants and hotels would usually be counted in the category of “Commerce.”

### **United States**

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business*. (Washington, DC: August 1996 and November 1999).

U.S. GDP data by industry in Table 1-3 are measured at market price, which includes factor cost and net indirect taxes. The industry classification and definition used in this table for the United States are generally based on the U.S. 1987 Standard Industrial Classification (SIC). However, some regroupings have been done for the sake of comparison. One regrouping has been done for transportation, communications and utilities, which are classified in Division E in the 1987 SIC. *Utilities* include electric, natural gas, sanitation and other miscellaneous utility services. The *Commerce* subcategory represents a combining of the U.S. SIC Division F for wholesale trade and Division G for retail trade. Starting in 1996, the Bureau of Labor Statistics reclassified some of the multimodal courier services from trucking to the air transportation industry. It was not possible to reclassify data for previous years. Therefore, the decrease in the trucking, warehousing and storage industry between 1995 and 1996 is reflective of a change in the data time series rather than an actual decrease in this industry. More detailed explanations can be found in the *Standard Industrial Classification Manual 1987* (U.S. Office of Management and Budget, Washington, DC).

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## SECTION 2: TRANSPORTATION AND THE ECONOMY

### Tables 2-1 Gross Domestic Product (GDP) Attributed to Transportation-Related Final Demand

(Current U.S. dollars)

#### All Countries

Transportation-related final demand is the sum of all consumer and government expenditures for transportation purposes, plus the value of goods and services purchased by businesses as investment for transportation purposes. It measures the importance of transportation from a demand perspective. Since it includes only expenditures on the final products of an economy, transportation-related final demand is comparable to Gross Domestic Product.

#### Canada

Statistics Canada. Input-Output Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 1-3. Canadian data are based on Canada's 1980 Standard Industrial Classification (SIC-80). However, a number of Canadian industry classifications were regrouped for the purposes of this table. The category "gross private domestic investment" in Table 2-1 excludes investment in telecommunication structures.

#### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Aguascalientes, Ags: 1997).

See notes for Table 1-3. Mexican data are based on Mexico's 1993 *Sistema de Cuentas*

*Nacionales de México* (Mexico's National Account System), for which the base year is 1993. However, a number of Mexican industry classifications were regrouped for the purposes of this table.

#### United States

Data used in this Table 2-1 are compiled by the Bureau of Transportation Statistics (BTS) based on the U.S. National Income and Product Accounts. This table is based on the following primary sources:

1990: U.S. Department of Commerce. Bureau of Economic Analysis. *Historical Data Tables*. (Washington, DC: 1990).

1995, 1996: U.S. Department of Commerce. Bureau of Economic Analysis (BEA). *Survey of Current Business*, August 1998, (Tables 2.6, 3.10, 4.3, 5.6, 5.8 and p.148); October 1998, (Tables 3.16 and 3.17), and special tabulations based on BEA's underlying statistical details. (Washington, DC: 1998).

*Personal consumption of transportation, total*: Road motor vehicles consist of new autos, used autos and other road motor vehicles such as new trucks and used trucks. Motor vehicles used primarily for recreation, boats, noncommercial trailers and aircraft are excluded. Road motor vehicle parts include tires, tubes, accessories and other parts. Motorcycles and other include motorcycles and bicycles. Transportation services include repair, greasing, washing, parking, storage, rental, leasing, tolls, insurance, purchased local and intercity transportation services. Motor fuel and lubricants include gasoline (all types) and oil used for autos, trucks, airplanes, motorcycles and boats. Details on airplane and boat shares are not available. A more detailed description of these items is provided in the technical notes for Table 2-2.

*Gross private domestic investment, total:* Transportation structures include railroads and petroleum pipelines. Transportation equipment consists of trucks, buses, truck trailers, autos, aircraft, ships and boats and railroad equipment.

*Exports/imports, total:* Goods and services that are counted as part of exports/imports include civilian aircraft, engines and parts; road motor vehicles, engines and parts; passenger fares, (including the receipts/payments of U.S./foreign air and ocean/cruise carriers for the transportation of non-U.S. residents/U.S. residents between the United States and foreign countries or between two foreign points) and other transportation. The total for road motor vehicle, engines and parts excludes boats, aircraft and noncommercial trailers. Other transportation includes the freight revenues of U.S./foreign-operated ocean, air and other carriers (such as rail, pipeline and Great Lakes shipping) for international transport of U.S. exports/imports and for the transportation of foreign freight between foreign points; port expenditure receipts (representing payments for goods and services purchased in the United States/foreign countries by foreign-operated/U.S. carriers); and receipts/payments of U.S./foreign owners from foreign operators for the charter of vessels and rental of freight cars and containers.

*Government transportation-related purchases, total:* Government purchases represent the sum of consumption expenditures and gross investment. Government purchases include federal, state and local purchases of transportation services of roads, water, air, railroad and transit. Government expenditures on transportation-related structures and equipment also are included. Defense related purchases include expenditures on

transportation of materials (care and movement of goods by water, rail, truck and air), the rental of trucks and other transportation equipment and warehousing fees, and travel of persons (care and movement of Department of Defense military and civilian employees), including tickets for all modes of travel, per diem, taxi fares, automobile rental and mileage allowances for privately owned vehicles.

**Table 2-2**  
**Personal Consumption Expenditures on Transportation by Subcategory of Expenditure**

(Current U.S. dollars)

**All Countries**

Personal consumption expenditures for transportation in Table 2-2 are conceptually the same as those that are included in Table 2-1. This table presents the same information with more detail, organized into different categories. Note that expenditures for freight shipments are not included in the U.S. and Mexican consumption data. However, expenditures for freight shipments by rail and intercity bus are included in Canadian data.

**Canada**

Statistics Canada. Input-Output Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 1-3. Canadian data are based on Canada's 1980 Standard Industrial Classification (SIC-80). However, a number of Canadian industry classifications were regrouped for the purposes of this table. Data in Table 2-2 reflect personal consumption expenditures by Canadian residents both in Canada and in foreign countries. Personal expenditures in Canada by foreigners are excluded.

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## Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Aguascalientes, Ags: 1997).

See notes for Table 1-3. Mexican data are based on Mexico's 1993 *Sistema de Cuentas Nacionales de México* (Mexico's National Account System), for which the base year is 1993. However, a number of Mexican industry classifications were regrouped for the purposes of this table.

## United States

Data used in Table 2-2 are compiled by the Bureau of Transportation Statistics (BTS) based on the U.S. National Income and Product Accounts. This table is based on the following primary sources:

1990: U.S. Department of Commerce. Bureau of Economic Analysis (BEA). *Historical Data Tables*. (Washington, DC: 1990).

1995, 1996: U.S. Department of Commerce. Bureau of Economic Analysis (BEA). *Survey of Current Business*, August 1998, Tables 2.4 and special tabulations based on BEA's underlying statistical details. (Washington, DC: 1998).

*User-operated transportation, total*: Combined as a whole, the categories for new and used passenger cars; new and used trucks; and parts and accessories of road motor vehicles correspond to the entry for road motor vehicles and parts in Table 2-1. As in Table 2-1, motor vehicles used primarily for recreation such as recreational boats, noncommercial trailers and aircraft are excluded from Table 2-2.

Data for new cars and trucks represent the number of units sold multiplied by the average retail list price, adjusted for discounts, sales taxes and transportation costs. Data for used cars and trucks represent the sum of profit margins that dealers make from selling used cars and trucks to nonbusiness buyers, plus adjustments for changes in the stock of used cars and trucks. Reimbursements to employees who purchase used cars for business or mixed-purpose uses, also are added. Reimbursements to employees who purchase used trucks for business or mixed-purpose uses are not included.

New and used motorcycles and other motor vehicles include motorcycles and bicycles. Parts and accessories of road motor vehicles consist of tires, tubes, accessories and other parts. Repair and rental include: (1) automotive repair shops, passenger car rental and leasing establishments, and other automotive service establishments; (2) gasoline service stations and other retail establishments handling motor vehicle repair and rental and leasing and (3) repair services by franchised car and truck dealers. Motor fuel (gasoline and diesel) and lubricants also include coolant and other products. Tolls consist of bridge, tunnel, ferry and road tolls. Insurance consists of premiums, less benefits and dividends, for motor vehicle insurance.

*Purchased intercity/local and suburban transportation*: The other category for purchased intercity transportation consists of baggage charges, coastal and inland waterway fares, travel agents' fees and airport bus fares. The mass transit category of local and suburban transportation consists of both transit rail and bus services.

**Table 2-3**  
**Government Expenditures for**  
**Transportation by Mode**

(Current U.S. dollars)

### Canada

Statistics Canada. Public Institutions Division. Special tabulations. (Ottawa, Ont.: 1999).

*Data coverage:* Data for government expenditures in this table reflect outlays for all phases of the acquisition, construction, operation and maintenance of the relevant transportation facilities and equipment as well as expenditures pertaining to related engineering and technical surveys. This function now includes the government transfers to its own business enterprises engaged in the transportation activities, especially public transit and railway services.

*Air:* Data reflect expenditures for navigational, air traffic and other related services, operating subsidy payments to regional air carriers and municipal airports, grants to flying clubs and payments for international air navigational services. At the provincial level, data include assistance to the aviation industry, municipal airports and other related services. At the local level, data include outlays related to municipal airports.

*Water transport:* Data reflect expenditures on development, maintenance, operation and control of navigational channels, canals, harbor and wharf facilities, ferries that do not form integral part of road systems, landings and other marine facilities. It also includes the costs of the related operations of the Coast Guard and certain northern transportation services.

*Pipeline, oil and gas:* Data reflect expenditures on the operation, construction, use and

maintenance of pipeline as well as grants and contributions to support the operation, construction and maintenance of pipeline systems.

*Rail:* Data reflect expenditures on the development, implementation and monitoring of policies and programs related to railway network rationalization and effectiveness. Rail data also include payments for railway relocation, contributions to railway passenger services infrastructure and to freight movements in certain geographical regions as well as grants for operations of railway facilities to resource areas.

*Road:* Data reflect expenditures on highways, secondary roads, roads to resource areas, boulevards, avenues and streets together with related storm sewers (where separated from sanitary sewers). Bridges, over and underpasses and road tunnels incorporated in highways also are included as well as those ferries that are usually operated by highway departments and form integral parts of road systems. Such ferries are distinguished from major lake and seagoing vessels and their supporting operations, which (if not classified as business enterprises), are assigned to the "water transport" category. The road data also include the costs of removing snow, debris, leaves and other deposits as well as surface sanding and flushing, expenses pertaining to traffic control and parking facilities.

### Mexico

1990: Secretaría de Programación y Presupuesto. *Cuenta de la Hacienda Pública Federal, 1990.* (Mexico City, D.F.: 1991).

1995 and 1996: Secretaría de Hacienda y Crédito Público. *Cuenta de la Hacienda Pública Federal, 1995 y 1996.* (Mexico City, D.F.: 1996 and 1997).

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*Rail:* Prior to 1996, freight and passenger railroad transportation services were provided by a single decentralized public agency. Expenditures for passenger services are included in freight services, but the amount is not significant. The decrease in expenditures was due to a reduction in public investment and to a significant and gradual reduction since 1991 of operational personnel by the Ferrocarriles Nacionales de México. This reduction was part of the preparation by the Ferrocarriles Nacionales de México for the transfer of rail service to the private sector. The first part of the transfer took place in December 1996. In addition, the intensive economic contraction of Mexico in 1995 caused a drop in public expenditures.

### **United States**

U.S. Department of Transportation. Bureau of Transportation Statistics. Special Tabulations. (Washington, DC: 1999) Based on the following primary sources:

1990: U.S. Department of Commerce. U.S. Census Bureau. *Government Finances: 1989-90*. (Washington, DC: 1990).

1995 and 1996: U.S. Department of Commerce. U.S. Census Bureau. Web site: [www.census.gov/govs](http://www.census.gov/govs)

All years, rail and pipeline: U.S. Department of Transportation, Bureau of Transportation Statistics. *Government Transportation Financial Statistics*. (Washington, DC: 1997).

Data for government expenditures in Table 2-3 refer to local, state and Federal Government in the United States. There are different sources of government expenditure data. For example, government accounts in the U.S. national account system, provide data on government consumption and gross investment. The publication, *Government Trans-*

*portation Financial Statistics* of the U.S. Bureau of Transportation Statistics, has extensive data on government expenditures on transportation. Table 2-3 uses the same sources as the *Government Transportation Financial Statistics* report, but the data are organized differently and include more original details from the primary data source, the *Annual Survey of Government Finances*, conducted by the U.S. Census Bureau.

The *Annual Survey of Government Finances* covers the entire range of government finance activities, including revenues, expenditures, debt and assets. This table is based on government expenditure data. Government expenditures are all direct expenditures, or direct expenditures by federal, state or local governments. (Intergovernmental transfers such as federal to state grants where funding is directly expended at the state level are only counted once.). Infrastructure expenditures include those for production of fixed works and structures and additions, replacements and major alterations. Equipment expenditures include those for purchase of equipment and for payments on capital leases. In some cases, purchase of land and existing structures also are included because data do not allow their separation. Expenditures on current operations include those for compensation of officers and employees and for supplies, materials, operating leases and contractual services. Data for pipelines and railroads are from *Government Transportation Financial Statistics* of the U.S. Bureau of Transportation Statistics, since the census does not provide any data on these modes.

For 1995, 1995 data for state and local governments and 1992 data for the Federal Government are included. For 1996, 1996 data for state governments, 1995 data for local

governments and 1992 data for the Federal Government are included. More recent federal data were not available during the research phase of this project. All data are on fiscal year basis (for example, fiscal year 1996 represents October 1, 1995, through September 30, 1996).

**Table 2-4**  
**Employment in Transportation and Related Industries**

**All Countries**

Employment by industry groups provides employment information according to the primary nature of a business. Table 2-4 shows how many people (based on the number of employees) worked in industries with transportation and related activities as their primary business. U.S. and Canadian data are based on the number of employees. Mexican data are based on the number of full-time employment positions.

**Canada**

Statistics Canada. *Employment, Earnings and Hours—Payrolls and Hours, Catalogue no. 72-002-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue no. 53-215-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

Transport Canada. *Transportation in Canada 1997—Annual Report*. (Ottawa, Ont.: 1998).

*Data source:* The monthly Statistics Canada, *Survey of Employment, Payrolls and Hours* (SEPH), is designed to provide monthly estimates to measure levels and month-to-month trends in employment by industry. The data are compiled for the payroll employment,

payrolls and hours from which different variables such as employment, average weekly and hourly earnings and average weekly hours, for Canada, provinces and territories at detailed industrial levels, are derived. The target population is composed of all employers in Canada, except those primarily involved in agriculture, fishing and trapping, private household services, religious organizations and defense services.

The SEPH draws its sample from the Business Register (BR) and from a list of all payroll deduction accounts maintained by Revenue Canada. The Business Register is a list of all businesses in Canada and is updated each month using data from various surveys, business profiling and administrative data maintained by the Business Register Division of Statistics Canada. The payroll deduction source represents all employers with remittances for employee income taxes, Canada/Québec Pension Plan and employment insurance contributions. The survey methodology is based on a census of establishments within an enterprise with a complex structure having more than 300 employees and on sample data from establishments within an enterprise with a simple or with complex structure having less than 300 employees. Data represent annual averages that are weighted and refer to 1 week out of each month.

*Industry employment categories:* Industries are defined at the three-digit level of Canada's Standard Industry Classification (SIC) of 1980. For comparability with Mexican and U.S. data, employment categories may have been rearranged and terminology may be different. For categories under *Local and Inter-urban Passenger*, data were obtained from the four-digit SIC 80 level from transportation surveys.

*Employed labor force:* Employed labor force figures in Table 2-4 differ from those in Tables 1-1 and 2-5. National labor force figures in this table represent the total employed civilian labor force. This figure differs from the data for Canadian labor force in Table 1-1 because it includes only those that are currently employed among the civilian Canadian labor force. In contrast, the data in Table 1-1 represent those individuals in the civilian labor force that are both employed and unemployed. Data for the employed labor force in Table 2-4 also differ from the data for employed labor force in Table 2-5. This is because Table 2-4 is based on one survey, the SEPH, while Table 2-5 is based on a different survey, the Labor Force Survey (LFS). The SEPH is based on a business survey of Canadian employers while the LFS is based on a household survey. Because of this and other methodological differences, the total for employed labor force differs between Table 2-4 and 2-5. For additional information, call the SEPH inquiry line at (613) 951-4090 or the Labor Statistics Division of Statistics Canada at (613) 951-4168.

### **Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Aguascalientes, Ags.: 1997).

Poder Ejecutivo Federal. *Informe de Gobierno*, various years. (Mexico City, D.F.: various years).

*Data source:* Data are a simple average of the 12-month period and are not a count of the number of people employed in economic activities, but rather an estimate of the number of positions required by each economic activity to carry out its economic production.

*Employed labor force:* Labor force data in this table do not agree with that of Table 1-1 (National Population and Labor Force) because the data sources for the two tables differ in their objectives and methodologies. Data in Table 1-1 are from the *Encuesta Nacional de Empleo (National Employment Survey)*, and represent the “población económicamente activa” (economically active population). (The economically active population is anyone 12 years of age or older.) Data for employed labor force in Table 2-4 are from the *Sistema de Cuentas Nacionales de México* (National Account System of Mexico) and refer to the number of people employed and under payroll.

### **United States**

Data used in Table 2-4 are compiled by the Bureau of Transportation Statistics (BTS) based on employment data from the Bureau of Labor Statistics and other sources. This table is based on the following primary sources:

Employed labor force, total: U.S. Department of Labor. Bureau of Labor Statistics. *Household Data Annual Averages, 1998*. Table 1. (available at BLS web site: [www.stats.bls.gov](http://www.stats.bls.gov))

Private Employment (Transport Sectors, Transportation Vehicle and Equipment Manufacturing and Related Industries):

1990, 1995: U.S. Department of Transportation, Bureau of Transportation Statistics, special tabulation based on data from U.S. Department of Labor. Bureau of Labor Statistics. *National Employment, Hours and Earnings, United States, 1988-1996*. (Washington, DC: various years). SIC 45.

1996: U.S. Department of Transportation, Bureau of Transportation Statistics, special tabulation based on data from U.S. Depart-

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ment of Labor. Bureau of Labor Statistics. *National Employment, Hours and Earnings, United States, June 1997*. (Washington, DC: 1997). Table B-12.

#### Government employment:

##### *Federal:*

1990, 1995: U.S. Department of Transportation. Office of the Secretary. *DOT Employment Facts, A Report to Management*. (Washington, DC: various years).

1996: U.S. Department of Transportation. Office of the Secretary. *DOT Workforce Facts*, October 1, 1995 through September 30, 1996. (Washington, DC: 1997).

##### *State and local:*

1990: U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States, 1998*. (Washington, DC: 1998). Table 531.

*Data source:* Employment by industry data are from the *National Employment, Hours, and Earnings* published by the Bureau of Labor Statistics (BLS), U.S. Department of Labor, which is a product of the *Current Employment Statistics* (CES) or establishment survey program. The CES is a monthly survey conducted by state employment security agencies in cooperation with the BLS. The survey provides employment, hours and earnings estimates based on payroll records of business establishments. Data represent annual employment averages, which are arithmetic averages of the 12 monthly estimates for a particular year.

The Bureau of Labor Statistics (BLS) does not publish data reliability information along with estimates. Instead, it provides estimation formulas and the necessary parameters so that users can estimate standard errors

for estimates of their interest. For additional information, see the “Explanatory Notes and Estimates of Error” in the BLS monthly publication *Employment and Earnings*.

*Industry categories:* School bus employment data do not include drivers employed by school districts. Transportation services in this table largely include services industries involved in arranging passenger and freight transportation, such as travel agencies and freight forwarders. The category of other transportation equipment includes motorcycles, bicycles, tanks and tank components. Federal Department of Transportation employment represents full and part-time civilian and Coast Guard employees. State and local government employment represents highway employment only.

*Employed labor force:* National labor force figures in this table represent the total employed civilian labor force. This figure differs from the data for U.S. labor force in Table 1-1 because it includes only those that are currently employed among the civilian U.S. labor force. In contrast, the data in Table 1-1 represent those individuals in the civilian labor force that are both employed and unemployed.

### **Table 2-5 Employment in Transportation- Related Occupations**

#### **All Countries**

Employment by occupation groups provides employment information according to the nature of a particular job. For example, since truck driving is a transportation activity, a truck driver employed by a retail company (such as a grocery store) is counted in the employment of transportation occupations, but *is not* counted in the employment of trans-

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portation industries (because a retail company such as a grocery store is not considered part of the transportation sector.)

Table 2-5 shows how many people (employees) worked in positions unique to transportation such as a truck driver, throughout the economy, including transportation and nontransportation industries. U.S. and Canadian data are based on the number of employees. Mexican data are based on the number of employment positions.

### **Canada**

Statistics Canada. *Historical labor force statistics, Catalogue no. 71-201-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

*Data source:* The Statistics Canada *Labor Force Survey (LFS)* is a household survey carried out monthly by Statistics Canada. The objectives of the LFS are to divide the working-age population into three mutually exclusive classifications (employed, unemployed and not in the labor force) and provide description and explanatory data on each of these categories. Data from the survey provide information on major labor market trends such as shifts in employment across industrial sectors, hours worked, labor force participation and unemployment rates.

On a monthly basis, the LFS surveys a sample of individuals who are representative of the civilian, noninstitutional population 15 years of age or older in Canada's ten provinces. Specifically excluded from the survey's coverage are residents of the Yukon and Northwest Territories, persons living on Indian Reserves, full-time members of the Canadian armed forces and inmates of institutions. These

groups together represent an exclusion of approximately 2 percent of the population aged 15 or older. Data represent annual averages that are weighted and refer to 1 week out of each month.

*Occupation categories:* Employment categories are based on Canada's 1980 Standard Occupation Classification (SOC). For comparability with Mexican and U.S. data, employment categories may be rearranged and terminology may be different.

*Employed labor force:* Employed labor force figures in Table 2-5 differ from those in Tables 1-1 and 2-4. National labor force figures in this table represent the total employed civilian labor force. This figure differs from the data for Canadian labor force in Table 1-1 because it includes only those that are currently employed among the civilian Canadian labor force. In contrast, the data in Table 1-1 represent those individuals in the civilian labor force that are both employed and unemployed. Data for the employed labor force in Table 2-5 also differ from the data for employed labor force in Table 2-4. This is because Table 2-5 is based on one survey, the LFS, while Table 2-4 is based on a different survey, the Survey of Employment, Payrolls and Hours (SEPH). The LFS is based on a household survey while the SEPH is based on business survey of Canadian employers. Because of this and other methodological differences, the total for employed labor force differs between Table 2-5 and 2-4. For additional information, call the LFS inquiry line at (613) 951-4090 or the Labor Statistics Division at Statistics Canada at (613) 951-4168.

### **Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad

Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Mexico City, D.F.: 1997).

Also see notes for Table 2-4 for employed labor force. Data on transportation employment by occupation are nonexistent, except for taxi cab drivers and chauffeurs.

### United States

Data used in this table are compiled by the Bureau of Transportation Statistics (BTS) based on employment data from the Bureau of Labor Statistics. This table is based on the following primary sources:

U.S. Department of Labor. Bureau of Labor Statistics. *Household Data Annual Averages*. Table 1. (Available at BLS web site: stats.bls.gov)

U.S. Department of Labor. Bureau of Labor Statistics. *Employment and Earnings*. Table 11 of the Annual Averages Tables, January issues (1984-1997), and BLS underlying statistical details. (Washington, DC: various years).

*Data source:* Employment by occupation data are from *Employment and Earnings*, a monthly publication of the Bureau of Labor Statistics (BLS). The data source of *Employment and Earnings* is the *Current Population Survey*, a monthly household survey conducted by the Census Bureau for the BLS. The *Current Population Survey* provides a comprehensive body of information on the employment and unemployment experience of the U.S. population, classified by age, sex, race, and a variety of other characteristics.

Annual employment averages are arithmetic averages of the 12 monthly estimates for a particular year. The BLS does not publish data reliability information along with estimates. Instead, it provides estimation formu-

las and the necessary parameters so that users can estimate standard errors for estimates of their interest. For additional information, see the “Explanatory Notes and Estimates of Error” in *Employment and Earnings*.

*Employed labor force:* National labor force figures in this table represent the total employed civilian labor force. This figure differs from the data for U.S. labor force in Table 1-1 because it includes only those that are currently employed among the civilian U.S. labor force. In contrast, the data in Table 1-1 represent those individuals in the civilian labor force that are both employed and unemployed.

### Table 2-6 Receipts and Payments Related to International Merchandise and Services Trade

(Current U.S. dollars)

#### All countries

Tables 2-6 through 2-8b contain data on international merchandise and service trade for the three countries. At the aggregate level, the data categories in these tables can be considered conceptually comparable across the countries. However, each country has also chosen to use its own data for international merchandise and services trade. For example, Table 2-7b reports Canadian trade with the United States, according to Canadian data sources. Table 2-8a reports U.S. trade with Canada, according to U.S. data sources. Differences between these data sources are caused by differences in definitions, methodologies and statistical sources, among the three countries. Also note that detailed data for Mexico were not available. Therefore, no Mexican tables have been included showing trade with Canada and the U.S., according to Mexican data

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sources. Merchandise trade data by country, value, weight, mode of transportation, port and commodity description are included in Sections 6 and 7.

### **Canada**

Statistics Canada. *Canada's Balance of International Payments, Catalogue 67-001-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

*Definitions of merchandise and services trade:* For this table, the definitions of goods and services are those utilized and defined by the Canadian Balance of Payments (BOP). Under this framework, goods are defined as exports and imports that are valued at the border of the exporting economy. That is, the valuation of goods includes transportation costs to the border. Inland freight charges are recorded as an adjustment to Canadian Customs trade data. Goods also include all goods that cross the border to be processed. Together with the inland freight adjustment to Canadian Customs trade data, additional adjustments are made for timing, coverage and other valuation and residency.

All services definitions were restated in May 1996 according to international norms first issued by the International Monetary Fund (IMF) in 1993 and extended jointly by the IMF, the OECD and the statistical arm of the European Union, Eurostat. The redefined services include the following categories: travel, transportation, commercial and government services. However, for the purposes of Table 2-6, 2-7a and 2-7b, Canadian data have been represented in the two major categories of transportation and tourism and other services. The Canadian data category "travel" is included in the tourism category for these

tables, and the Canadian categories of "commercial and government services" are included in the other services category for these tables.

*Merchandise exports:* Merchandise exports data in this table are based on Canadian Customs export data that are published by the International Trade Division of Statistics Canada. Canadian Customs exports to overseas countries are valued f.o.b. (free on board) port of exit. Canadian Customs exports to the United States are valued f.o.b., point of exit (at the border). Customs data therefore, include inland freight charges, but these are removed from the Balance of Payment data, as a negative adjustment to the trade. A new Balance of Payments estimate for inland freight is then added to the exports, which are valued at plant basis. (Valued at plant basis means the value of goods f.o.b. (free on board) at the place of lading; i.e., at the point of production for the majority of commodities.) Other Balance of Payments adjustments include adjustments for valuation, residency, timing and coverage.

*Merchandise imports:* Merchandise imports data in this table are based on Canadian Customs import data that are published by the International Trade Division (ITD) of Statistics Canada. For Table 2-6, Canadian customs imports are valued f.o.b., based on the place of direct shipment to Canada. Although it does not make any difference at the aggregate level, import data released by Statistics Canada's Balance of Payments and International Trade Divisions are different on a geographical basis. The International Trade Division records the imports according to a country of origin basis while the Balance of Payments Division reports imports on a country of last consignment basis.

*Transportation services:* Transportation services cover receipts and payments related to the transportation of persons and goods by air, water and land, together with supporting services for the various modes of transport. Receipts cover passenger fares received by Canadian carriers (primarily air) from nonresidents; services of carriers operated by Canadian residents (ocean ships, lake vessels, aircraft, rail and trucks) that transport merchandise exports beyond the borders of Canada; carriers operated by Canadian residents engaged in the transportation of commodities between foreign countries (including intransit movement and transit between U.S. points via Canada); income from the charter of vessels; and port expenditures in Canada by nonresidents air and shipping companies. Payments cover passenger fares paid to nonresident carriers (chiefly air) by Canadian residents. The data also include most outlays on cruises although such outlays should in principle be assigned to travel. Payments also cover the transport by nonresident carriers of imports into Canada (excluding inland freight charges in the United States and other countries); the transport of Canadian commodities in transit through the United States (in particular oil and natural gas); the charter of foreign vessels; and port expenditures abroad by Canadian resident air and shipping companies.

*Tourism and other services:* Data for tourism cover all receipts and payments arising from the travel of less than 1 year between Canada and other countries, and for travel of more than 1 year for educational or health purposes. Travelers of more than 1 year are otherwise treated as residents of the country to which they travel except for diplomats and military personnel on postings abroad. Data for other services include government ser-

VICES for international transactions arising from government activities (diplomatic, commercial and military) not covered elsewhere in the Balance of Payments. Receipts for this category chiefly comprise expenditures in Canada by foreign governments. Payments for this category mainly cover expenditures abroad of both the Canadian federal and provincial governments. Other services also include receipts and payments for commercial services.

### **Mexico**

Banco de México. *Indicadores Económicos*. (Mexico City, D.F.: 1998).

Data are based on the Banco de Mexico's Balance of Payments, Current Account framework. Transactions of the maquiladora industry are included in services and merchandise trade for 1995 and 1996, but *not* for 1990. For the category Merchandise Exports, export valuation is made on an FOB basis; i.e., the value of the goods at their point of origin, plus freight, insurance and other costs to move the goods to the outbound customs house. For the category Merchandise Imports, imports are valued on an FOB basis; i.e., market value of the goods at the point of origin, plus freight, insurance and other expenses to move the goods to the inbound customs house. For the category Tourism and Other Services, tourism includes expenditures by tourists, including people on day-excursions (i.e., those tourists who do not stay overnight). The category Transportation includes costs of freight and insurance.

### **United States**

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business*. (Washington, DC: September 1993, July 1996, and October 1997).

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U.S. Department of Commerce. Bureau of Economic Analysis. *1998 Annual Services Historical Disk*. (Washington, DC: 1998).

*Merchandise exports and imports:* Exports exclude goods exported under U.S. military agency sales contracts identified in the U.S. census export data. Imports exclude goods under direct defense expenditures identified in the U.S. census import data. Merchandise imports are valued according to the "Customs value," which represents the value of merchandise for duty (or Customs) purposes. (Thus, the Customs value is usually the selling price in the foreign country of origin, and *excludes* freight costs, insurance and other charges incurred in bringing the merchandise from the foreign port of export to the United States.) For exports to all countries except Canada, export values represent the reported value of the merchandise, usually the selling price, plus insurance, inland freight costs and other charges incurred in bringing the merchandise to the U. S. port of export. This is generally called the f.a.s. (free alongside ship) value. Because the United States does not collect information for U.S. exports to Canada from its own trade documents, the value of these exports represents the transaction value of the merchandise, plus a Statistics Canada *imputed* estimate of the costs of insurance, inland freight and other charges.

*Trade adjustments, total:* The Bureau of Economic Analysis (BEA) at the Department of Commerce makes several adjustments to U.S. merchandise trade data when these are incorporated in the U.S. Balance of Payments. These include adjustments for inland freight charges and other adjustments made for valuation, residency, timing and coverage purposes. Inland freight adjustments are made to U.S. data for merchandise imports

from Canada because the Customs value of imports for certain Canadian goods is the point of origin in Canada rather than the port of export in Canada. Since the reported value of U.S. exports includes inland freight costs, no adjustments are needed, except for U.S. exports to Canada. Because the United States does not collect information for U.S. exports to Canada from its own trade documents, the value of these exports represents the transaction value of the merchandise, plus a Statistics Canada *imputed* estimate of the costs of insurance, inland freight and other charges. The Statistics Canada estimate is based on 4.5 percent of the export merchandise transaction value.

*Total services:* Total services data include total transactions in services, including private services, U.S. government miscellaneous services and some goods. Export services also include transfers under U.S. military agency sales contracts. Import services also include direct defense expenditures. Private services included in the total services category consist of the following categories in the U.S. Balance of Payments: (1) travel, (2) passenger fares, (3) other transportation, (4) royalties and license fees and (5) other private services.

*Transportation services:* Transportation services data include passenger fares paid by residents of one country to airline and vessel operators who reside in another country. Exports consist of fares received by U.S. operators for transporting foreign residents between the United States and a foreign country and between foreign countries. Imports consist of fares paid to foreign operators by U.S. residents for travel to and from the United States. The rest of transportation services include transactions for freight and port

services for the transportation of goods by water, air and land to and from the United States. Freight receipts of U.S. carriers are for transporting U.S. goods between two foreign points; freight payments to foreign carriers are for transporting U.S. merchandise imports. Port services receipts are the value of the goods and services procured by foreign carriers in both U.S. ocean and air ports; port services payments are the value of goods and services procured by U.S. carriers in foreign ocean and air ports. The land transportation receipts and payments cover U.S. transactions with Canada and Mexico through trucks, rail and pipelines. However, trucking operations between the United States and Mexico are currently limited by regulation.

*Tourism and other services:* Tourism and other services data are based on a compilation of the following categories in the U.S. balance of payments account: travel, passenger fares, other transportation, royalties and license fees, other private services and government services. Tourism is not a separate category in these accounts. Therefore, the number for this entry is the difference between total services and transportation.

**Tables 2-7a and 2-7b**  
**Canada's Receipts From and Payments to Mexico for Merchandise and Services Trade**

**Canada's Receipts From and Payments to the United States for Merchandise and Services Trade**

(Current U.S. dollars)

**Canada**

Statistics Canada. *Canada's Balance of International Payments, Catalogue 67-001-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

Tables 2-7a and 2-7b contain import data based on customs origin and based on consignment. The category, *Imports, Customs Origin*, are those imports that are attributed to their country of origin; that is, the country in which the goods were grown, extracted or manufactured in accordance to the rules of origin administered by Revenue Canada, Customs and Excise. The category, *Imports, Consignment* are those imports that are attributed to their last country of consignment. This valuation is done for Balance of Payment purposes and better reflects the notion of change of ownership.

**Tables 2-8a and 2-8b**  
**U.S. Receipts From and Payments to Canada for Merchandise and Services Trade**

**U.S. Receipts From and Payments to Mexico for Merchandise and Services Trade**

(Current U.S. dollars)

**United States**

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business*. September 1993, July 1996 and October 1997. (Washington, DC: various years).

U.S. Department of Commerce. Bureau of Economic Analysis. *1998 Annual Services Historical Disk*. (Washington, DC: 1998).

See note for Table 2-6 for an additional explanation of similar data elements. However, note that total services in Tables 2-8a and 2-8b include only private services. Data were not available for government services because the government services data are not reported at the level of individual countries.

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## SECTION 3: TRANSPORTATION SAFETY

## Canada

### Tables 3-1 and 3-2 Transportation Fatalities by Mode Transportation Injuries by Mode

#### All Countries

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

**Road:** The United States and all Canadian provinces and territories, with the exception of the province of Québec, count all fatalities that occur within 30 days of the accident (and can be attributed to the accident). Canada's Province of Québec counts all fatalities that occur within 8 days of the accident (and can be attributed to the accident). Mexico counts only fatalities at the site of the accident. In the U.S., the 30-day rule was initiated for fatalities from road crashes in September 1978, and a consensus to apply this rule across all modes was formulated in 1995.

**Water transport:** U.S. and Canadian data are not comparable in several respects. First, the United States counts fatalities and injuries from vessel casualties for U.S. flag vessels *anywhere in the world*, and for foreign flag vessels within the jurisdiction of the United States. The Canadian data include only Canadian and foreign flag vessels operating in Canadian waters. Second, the Canadian data exclude all fishing vessels, except factory ships; the United States data include fishing vessels. (See the entries under Canada and the United States, below, for more complete definitions.)

Tables 3-1 and 3-2 are based on the following primary sources:

**Air:** Transportation Safety Board of Canada. (TSB) 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. (TSB) 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).

The following definitions apply for air, rail and water data in Tables 3-1 through 3-4. Technical notes for Canadian data in Tables 3-1 and 3-2 adhere to these definitions.

**Aviation accident:** A reportable aviation accident is an accident resulting directly from the operation of an aircraft where a person sustains a serious injury or is killed as a result of: being on board the aircraft; coming into contact with any part of the aircraft or its contents; being directly exposed to the jet blast or rotor down-wash of the aircraft; the aircraft sustaining damage that adversely

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affects the structural strength, performance or flight characteristics of the aircraft and that requires major repair or replacement of any affected component part; or the aircraft is missing or inaccessible.

*Serious air injury:* A serious air injury is an injury that is sustained by a person in an accident and that: requires hospitalization for more than 48 hours, commencing within 7 days of the date that injury was received; results in a fracture of any bone (except simple fractures of fingers, toes or nose); involved lacerations that cause severe hemorrhage, nerve muscle, or tendon damage; involves injury to any internal organ; or involves second or third degree burns, or any burns affecting more than 5 percent of the body surface; involves verified exposure to infectious substances or injurious radiation.

*Railway accident:* A reportable railway accident is one resulting directly from the operation of rolling stock, where: (1) a person sustains a serious injury or is killed as a result of being on board or getting off the rolling stock or coming into contact with any part of the rolling stock or its contents; or (2) the rolling stock is involved in a grade-crossing collision, is involved in a collision or derailment and is carrying passengers; 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; sustains damage that affects its safe operation; or 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.

*Serious rail injury:* A serious rail injury is one that is likely to require admission to a hospital.

*Marine accident:* A reportable marine accident means an accident resulting directly from the operation of a ship other than a pleasure craft, where a person sustains a serious injury or is killed as a result of: being on board the ship or falling overboard from the ship, or coming into contact with any part of the ship or its contents, or the ship sinks, founders or capsizes, is involved in a collision (which includes collisions, strikings or contacts), sustains a fire or an explosion, goes aground, sustains damage that affects its seaworthiness or renders it unfit for its purpose, or is missing or abandoned. In this definition, “ship” includes: a) every description of vessel, boat or craft designed, used or capable of being used solely or partly for marine navigation without regard to method or lack of propulsion. For statistical purposes, these accidents are classified as “accidents aboard ship.” In addition, the definition of “ship” also includes dynamically supported craft. For statistical purposes, these are classified as “shipping accidents.” “Pleasure craft” means a vessel that is used for pleasure or recreation and does not carry goods or passengers for hire or reward.

*Air:* Data in Tables 3-1 and 3-2 comprise fatalities and injuries on Canadian aircraft involved in accidents in domestic and international airspace. Passenger and all-cargo flights are included. Scheduled and nonscheduled flights are included. Fatalities and injuries that occur on the ground are excluded from the statistics.

*Air carrier:* Air carrier data in Tables 3-1 and 3-2 are compiled according to regulatory definitions of registered aircraft types established by the Transportation Safety Board of Canada and include the following types of Canadian registered aircraft used by Canadian air operators that offer a “for-hire” service to transport people or goods, or to undertake specific tasks such as aerial photography, flight training and crop spraying:

- (1) An **airliner** is an airplane used by a Canadian air operator in an air transport service or in aerial work involving sightseeing operations, that has 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.
- (2) A **commuter aircraft** is an airplane used by a Canadian air operator, in an air transport service or in aerial work involving sightseeing operations, of any of the following aircraft: a) a multi-engined aircraft that has a maximum take-off weight (MCTOW) of more than 8,618 kg (19,000 pounds) and a seating configuration, excluding pilot seats, of 10 to 19 inclusive; or b) a turbo-jet-powered aeroplane that has a maximum zero fuel weight of 22,680 kg (50,000 pounds) or less and for which a Canadian type certificate has been issued authorizing the transport of not more than 19 passengers.

- (3) An **air taxi or specialty aircraft** is an airplane used by a Canadian operator on an on-hire basis that does not satisfy the definition of an airliner or a commuter aircraft. Air carrier data also may include fatalities and injuries from charter aircraft operations.

Air data in Table 3-1 and Table 3-2 include fatalities and injuries that occurred on all passenger and cargo flights of Canadian registered aircraft during 1990, 1995 and 1996, operating domestically and internationally. The numbers of fatalities and injuries that occurred on cargo flights of Canadian registered aircraft during 1990, 1995 and 1996 are as follow:

| Year | Fatalities | Injuries |
|------|------------|----------|
| 1990 | 0          | 1        |
| 1995 | 0          | 0        |
| 1996 | 4          | 0        |

**Note:** In 1991, there was one fatality/injury-type air accident in the Province of Québec involving a Canadian registered cargo aircraft (Reference: Transportation Safety Board of Canada Occurrence Number 91Q0150). This air accident had one air fatality and one air injury.

*General aviation:* General aviation data in Tables 3-1 and 3-2 are compiled according to regulatory definitions established by the Transportation Safety Board of Canada and includes fatalities and injuries on ultra-light aircraft, private and commercial helicopter operations and from flights that do not transport people or cargo on a “for-hire” basis.

Below are the specific details of those air accidents involving cargo flight of Canadian registered aircraft during 1990, 1995 and 1996:

| Occurrence number | Occurrence date | Province of occurrence | Number of fatalities | Number of injuries |
|-------------------|-----------------|------------------------|----------------------|--------------------|
| 90Q0119           | 05/19/90        | Québec                 | 0                    | 1                  |
| A95Q0144          | 07/28/95        | Québec                 | 0                    | 0                  |
| A96A0134          | 07/22/96        | Newfoundland           | 3                    | 0                  |
| A96P0175          | 08/14/96        | British Columbia       | 1                    | 0                  |

**Note:** In 1995, there was one air accident, which occurred in the Province of Québec (Reference: Transportation Safety Board of Canada Occurrence Number A95Q0144) involving a Canadian registered cargo aircraft for which there was extensive damage reported to the aircraft, but no fatalities or injuries.

*Road:* Road data for passenger cars and light trucks include statistics for automobiles and light trucks (pick-ups, sports utility vehicles and mini-vans). Motorcycle data include both mopeds and motorcycles. Data for heavy trucks include straight trucks greater than 4,536 kilograms, (a straight truck has a configuration where both the vehicle's power unit and cargo storage unit share the same chassis), tractor-trailers and other unspecified trucks. Road data for other types of road injuries and fatalities include all other vehicle types and nonvehicle occupants involved in a motor vehicle traffic collision. Road data for Canadian motor vehicle fatalities and injuries are derived from the Canadian Traffic Accident Information Database (TRAID). TRAID is a collection of data pertaining to traffic collisions provided annually to Transport Canada by Canada's ten provinces and three territories. These collisions are all those deemed reportable; i.e., they occur on public roads and incur bodily harm and/or property damage exceeding a stipulated dollar threshold. This threshold is determined independently by each provincial and territorial jurisdiction.

The accident segment contains general data about the accident scene such as road conditions and summary accident statistics such as the total number of persons killed. Each accident within each province and each calendar year has a unique case number. The vehicle segment contains vehicle specific data such as the vehicle type and the vehicle actions prior to and during the collision. Each vehicle involved in the collision will have a separate vehicle segment. Therefore, if there are two vehicles involved there will be two different vehicle segments associated with that collision. Each of these vehicles will have a unique vehicle identification number.

*Pipeline:* Pipeline data in Table 3-2 include both minor and serious injuries for 1990. Only serious injuries are included for 1995 and 1996.

*Rail:* Rail data for Table 3-2 include both minor and serious injuries for 1990. Only serious injuries are included for 1995 and 1996.

*Water transport, commercial:* Water data for both commercial passenger vessels and commercial freight vessels include both Canadian and foreign flag vessels operating in Canadian waters. Data for commercial passenger vessels include, e.g., cruise ships and ferries. Data for commercial freight vessels include cargo/container, bulk carrier/OBO (Ore-Bulk-Oil) carrier, tanker, tug, barge/pontoon and ferry vessels. Data for commercial freight vessels exclude all fishing vessels, except factory ships, as well as research vessels, oil exploration and support ships.

*Water transport, recreational boats:* Water data for recreational boating include drownings from recreational, daily living, occupational, rescue and unknown purposes, as well as other fatal boating injuries including immersion, hypothermia, collisions and propeller injuries. The source for this information is the Canadian Red Cross. Fatalities for 1990, and injuries for 1990 through 1996, are nonexistent.

### **Mexico**

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

*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 Policía Federal de Caminos y Puertos. (Mexico City, D.F.: 1998).

*Air:* Data represent fatalities and injuries arising from general aviation accidents or incidents recorded within Mexico, and include passenger and crew fatalities and injuries at the site of the accident. All-cargo flights are not included, although the number of fatalities and injuries from all-cargo flights is estimated to be small.

*Road:* In Table 3-1, data refer to fatalities in fatal accidents; i.e., where one or more people died at the site of the accident. In Table 3-2, data refer to people injured in an accident; i.e., where one or more people were injured, with or without fatalities. The numbers assigned by type of vehicle refer only to accidents in urban and suburban areas. For accidents in zones of federal jurisdiction, no breakdown by type of vehicle is available, but the fatalities and injuries are included in the overall totals for road. Therefore, the road subcategories will not sum to the overall road totals for fatalities and injuries. The subcategory of "other" includes accidents in trolley buses, trams, bicycles and others.

*Rail:* Data include only fatalities and injuries from accidents in urban and suburban zones.

### **United States**

Tables 3-1 and 3-2 are based on modifications of similar tables (including adjustments to definitions) published in the U. S. Department of Transportation, Bureau of Transportation Statistics. *National Transportation Statistics 1998.(NTS-98)* (Washington, DC: 1998) and *National Transportation Statistics 1999 (NTS-99)* (Washington, DC: 1999).

Tables 3-1 and 3-2 are based on the following primary sources:

*Air:* National Transportation Safety Board. *Aviation Accident Statistics*. Web site: [www.nts.gov/aviation/Stats.htm](http://www.nts.gov/aviation/Stats.htm)

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National Transportation Safety Board. *Accident Synopses*. Web site: [www.nts.gov/aviation/Accident.htm](http://www.nts.gov/aviation/Accident.htm)

National Transportation Safety Board. *Annual Review of Aircraft Accident Data*, annual issues and *NTSB Press Release, SB97-03*. (Washington, DC: various years). (fatalities)

National Transportation Safety Board. Analysis and Data Division, RE-50. (Washington, DC: various years). (injuries)

See also: U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation 1996*. (Washington, DC: 1997). Chapter 9. Web site: [api.hq.faa.gov/handbook/1996/toc96.htm](http://api.hq.faa.gov/handbook/1996/toc96.htm)

Road: U.S. Department of Transportation. National Highway Traffic Safety Administration. National Center for Statistics and Analysis. *Fatality Analysis Reporting System (FARS)*, and, for injuries, *the General Estimates System (GES)*, 1998. (Washington, DC: 1998).

U.S. Department of Transportation. National Highway Traffic Safety Administration. *Traffic Safety Facts, 1997*. (Washington, DC: November, 1998).

Pipeline (liquid and gas): U.S. Department of Transportation. Research and Special Projects Administration. Office of Pipeline Safety, DPS-35. (Washington, DC: 1998).

Rail: Highway grade crossing: U.S. Department of Transportation. Federal Railroad Administration. *Rail-Highway Crossing Accident/Incident and Inventory Bulletin*. (Washington, DC: various years). Table S.

Railroad: U.S. Department of Transportation. Federal Railroad Administration. *Accident/Incident Bulletin*. (Washington, DC: various years). Table 7.

Transit: Transit rail: U.S. Department of Transportation. Federal Transit Administration. *Safety Management Information Statistics (SAMIS)*. (Washington, DC: various years).

Water: Commercial freight and passenger Vessels: U.S. Department of Transportation. U.S. Coast Guard. Office of Investigations and Analysis. Compliance Analysis Division, G-MOA-2. (Washington, DC: 1998).

Recreational boating: U.S. Department of Transportation. U.S. Coast Guard. Office of Investigations and Analysis. Compliance Analysis Division. *Boating Statistics*. (Washington, DC: various years).

*Cross-modal comments*: For 1995 and 1996, a death is attributed to a transportation incident if the death occurred up to 30 days after the incident. For 1990, this may not be true for all modes, but this definition has applied in the Road mode since September of 1978.

Caution must be exercised in comparing U.S. fatalities (and injuries) across modes, because significantly different definitions for reportable **events** are used among the modes. In particular, rail and transit fatalities and injuries include deaths and injuries that are not, strictly speaking, caused by transportation accidents, but are caused by such events as a fall on a transit station escalator, or, for railroad employees, a fire in a workshed. Similar fatalities for the air and highway modes (deaths at airports not involving aircraft, or fatalities from accidents in automobile repair shops) are not counted towards the totals for these modes. Counting fatalities not necessarily directly related to transportation potentially overstates the risk for the rail and transit modes. For the waterborne mode, fatalities from vessel casualties are counted in the total, and other

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fatalities are not counted. (Vessel casualties are incidents involving damage to vessels, for example, from collisions, groundings, fires or explosions.) Fatalities not from vessel casualties include, for example, deaths from accidents involving on-board equipment. Thus, fatalities for the waterborne mode are potentially understated. (Everything stated above about fatalities also applies to injuries.) In addition to the modal differences for definitions of reportable events, definitions of reportable injuries also vary among the modes. See the *National Transportation Statistics (NTS)-99* or the *NTS-98* for a description of what constitutes a reportable injury for each mode.

In addition, it should be emphasized that the numbers for total fatalities and injuries are less than the sum of the modal totals for the United States because some deaths (injuries) are reported and counted in more than one mode. To avoid double counting, the following components **have been counted only once** in arriving at the overall totals shown in Tables 3-1 and 3-2:

- (1) Rail-highway grade crossing fatalities (injuries) involving motor vehicles: These are counted in both the rail and road modes, and are included in both modal totals.
- (2) Commuter rail fatalities (injuries) arising from *incidents*: These are counted in both the rail and the transit modes, and are included in both modal totals.
- (3) Motor bus fatalities (injuries) arising from *accidents*: These are counted in both the road and the transit modes, and are included in both modal totals.

- (4) Demand response and vanpool fatalities (injuries) arising from *accidents*: These are counted in both the road and the transit modes, and included in both modal totals.

For additional information, refer to Table 3-4 in the *National Transportation Statistics—1998* or the *National Transportation Statistics-1999* to see exactly how these adjustments have been made to the 1995 and 1996 fatality totals. Note that *incidents include accidents; that is, accidents are a subset of incidents*. See below under the individual modal comments on transit and rail for more complete definitions of incidents and accidents. Data on highway-rail grade crossing fatalities and injuries that involved motor vehicles are provided in the annual issues of the Federal Railroad's Administration's *Highway-Rail Crossing Accident/Incident and Inventory Bulletin*. (See above for the full citation.) Data on transit accidents and incidents by submode are provided in the *National Transportation Statistics, 1999*, Tables 3-28 and 3-29.

*Air*: Air carriers include all U.S. flag carriers, comprising both scheduled and nonscheduled flights, both domestic and international flights, and both passenger and all-cargo flights. Commuters and on-demand air taxis are included. In Table 3-2, only "serious injuries" are reported. (See the *National Transportation Statistics (NTS)-1999* or the *NTS-98* for the definition of a serious injury in air accidents.) U.S. air fatality and injury data are based on reports from the National Transportation Safety Board (NTSB). NTSB investigators perform on-site and off-site investigation of all accidents involving U.S. registered air carriers and general aviation aircraft. Federal regulations require operators to notify the NTSB immediately of avia-

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tion accidents and certain incidents. According to the NTSB, a reportable accident “is defined as an occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage.” Web site: [www.nts.gov/aviation/report.htm](http://www.nts.gov/aviation/report.htm).

As stated above, the air safety data include both passenger and all-cargo flights. The National Transportation Safety Board’s web site at [www.nts.gov/aviation/Accident.htm](http://www.nts.gov/aviation/Accident.htm) does not separate passenger flights from all-cargo flights. However, for flights operating under 14 CFR-121 (aircraft with more than 30 seats or a payload of more than 7,500 pounds), the detailed accident reports available on the web site make it clear which were all cargo flights. For smaller aircraft, particularly on-demand air taxis, it is not possible to infer with confidence how many were all cargo flights from the information available on the web site. **For aircraft operating under CFR-121:**

1990: 6 fatal accidents, of which 2 were all-cargo flights; 39 fatalities, of which 28 occurred as the result of an all-cargo aircraft crash. (Ground fatalities included.)

1995: 3 fatal accidents, of which 2 were all-cargo flights; 168 fatalities, of which 8 occurred as the result of an all-cargo aircraft crash. (Ground fatalities included.)

1996: 5 fatal accidents, of which 2 were all-cargo flights; 380 fatalities, of which 38 occurred as the result of an all-cargo aircraft crash. (Ground fatalities included.)

It should also be noted that during the research phase of this project, a change in regulations occurred. Since March 20, 1997, 14 CFR-121 began to cover some smaller aircraft (i.e., aircraft with 10 or more seats) that were formerly regulated under 14 CFR-135. This change does not affect the data in this publication, because of its 1996 cutoff.

*Road:* The data for passenger cars, light trucks, buses and large trucks are the number of *occupants* of these vehicles who have been killed (injured) in road crashes. In Tables 3-1 and 3-2, *Light Truck* means trucks of 4,536 kg (i.e., 10,000 pounds) gross vehicle weight rating or less, and *Large Truck* means trucks of over 4,536 kg gross vehicle weight rating. Note that these definitions differ from those in some other tables in this publication. Buses include intercity buses, school buses and local transit buses. The subcategory of “other” represents pedalcyclists, other nonoccupants and unknown. See the *National Transportation Statistics (NTS)-1999* or the *NTS-98* for the definitions of a reportable road injury.

U.S. road fatality data come from the Fatality Analysis Reporting System (FARS), and are compiled by FARS analysts at the regional offices of the U.S. Department of Transportation’s National Highway Traffic Safety Administration (NHTSA). FARS analysts use a census of police accident reports, state vehicle registration files, state drivers licensing files, state highway department data, vital statistics, death certificates, coroner/medical examiner reports, hospital medical reports and emergency medical service reports. A separate form is completed for each fatal crash. Fatality data are continuously collected and electronically submitted to the NHTSA database. Cross verification of police reports with death certificates ensures that

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undercounting is rare. The FARS data do not include motor vehicle fatalities on nonpublic roads. However, previous NHTSA analysis has found that these fatalities account for 2 percent or fewer of the total motor vehicle fatalities per year.

U.S. road injury data come from the General Estimates System (GES) of the National Traffic Safety Administration at the U.S. Department of Transportation. The GES data are a nationally representative sample of police reported crashes involving at least one motor vehicle and resulting in injuries, fatalities and property damage in which a police accident report (PAR) was filled out. GES data collectors randomly sample PARs and forward copies to a central contractor for coding into a standard format for the GES system. Documents such as police diagrams or supporting text provided by the officer may be further reviewed to complete the data entry. Various sources suggest that about half of the motor vehicle crashes in the United States are not reported to police and that the majority of these unreported crashes involve minor property damage and no significant personal injury. A NHTSA study of injuries from motor vehicle crashes estimated the total count of nonfatal injuries at over 5 million compared with the GES's estimate of 3.2 million for the same year.

*Pipelines:* U.S. fatality and injury data for pipeline in Tables 3-1 and 3-2 are based on liquid (crude oil and petroleum products) and natural gas pipelines. Each of these is regulated under separate safety regulations by the Office of Pipeline Safety of the Research and Special Projects Administration at the U.S. Department of Transportation. For both liquid and natural gas pipelines, accidents are required to be reported as soon as possible, but no later than 30 days after discovery. Re-

ports are sent to the Federal Office of Pipeline Safety's Information Systems Manager. Possible sources of error include a release going undetected, even if such a release is subsequently detected and reported, it may not be possible to reconstruct the accident accurately.

*Liquid pipelines:* U.S. fatality and injury data for liquid pipelines are derived from reports filed with the Office of Pipeline Safety at the Research and Special Projects Administration, USDOT. These reports are based on regulations that define a reportable accident for liquid pipelines as: "...each failure in a pipeline system... in which there is a release of the hazardous liquid or carbon dioxide transported resulting in any of the following: (a) explosion or fire not intentionally set by the operator; (b) loss of 50 or more barrels of hazardous liquid or carbon dioxide; (c) release to the atmosphere of more than five barrels a day of highly volatile liquids; (d) death of any person; and (e) bodily harm to any person; and (f) estimated property damage to the property of the operators or others, or both, exceeding \$50,000. (For more information, refer to *NTS-98* or *NTS-99*).

*Natural gas pipelines:* U.S. fatality and injury data for natural gas pipelines are based on reports filed with the Office of Pipeline Safety at the U.S. Department of Transportation. These reports conform with regulations from the same office that define a reportable accident for gas pipelines as any of the following events:

- (1) An event that involves the release of gas from a pipeline or liquefied natural gas or gas from an LNG facility and
  - (i) a death, or personal injury necessitating in-patient hospitalization; or

- (ii) estimated property damage, including cost of gas lost, of the operator or others, or both, of \$50,000 or more.
- (2) An event that results in an emergency shutdown of an LNG facility.
- (3) An event that is significant, in the judgment of the operator, even though it did not meet the criteria of paragraphs (1) or (2)."

*Railroad:* Railroad data include intercity passenger, freight rail and commuter rail fatalities and injuries. Note that commuter rail fatalities and injuries also are reported under transit, as explained above in Cross-Modal comments. U.S. railroad fatality and injury data are based on reports that railroads are required to file for each train accident resulting in property damage in excess of \$6,300, each highway-rail accident, and each incident involving the operation of a railroad resulting in a fatality or a reportable injury. These reports cover workers, trespassers and others not on trains in addition to passengers and train crew. For more detail, see the U.S. Department of Transportation, Federal Railroad Administration, *Highway-Rail Crossing Accident/Incident and Inventory Bulletin, Calendar Year 1994* (July 1995), which also defines a reportable injury for rail, or refer to the *National Transportation Statistics (NTS)-1999* or the *NTS-98*.

The Federal Railroad Administration defines three categories of reportable events:

- (1) Train Accident: a collision, derailment, or other event involving the operation of railroad on-track equipment resulting in damages that exceed the reporting threshold.

- (2) Train Incident: any event involving the movement of railroad on-track equipment that results in a death, a reportable injury, or a reportable illness, but in which railroad property damage does not exceed the reporting threshold.
- (3) Nontrain Incident: an event arising from railroad operations but not from the movement of on-track equipment, which does not exceed the reporting threshold, and results in a death, a reportable injury, or a reportable occupational illness.

The reporting requirements (established in law) encompass events not strictly related to transportation. For example, if a passenger falls and breaks a leg in the station while going to a train, the injury would be reported and appear in the data as a rail injury.

*Transit:* In Tables 3-1 and 3-2 the transit total includes: transit motor bus; trolley bus; light rail (streetcar-type vehicles); heavy rail (subway); commuter rail; van-pool; demand-response (mainly transportation for the disabled or elderly); and automated guideway (electric railway operated without a vehicle operator or other crew). Figures for transit rail include light rail, heavy rail and commuter rail. Commuter rail also is included in the data for railroad fatalities and injuries. The transit total does not include data for several minor submodes, notably cable cars and ferryboats; see the *National Transportation Statistics-99 (NTS-99)*, footnotes to Tables 3-27, 3-28 and 3-29 for data on these submodes. See the *NTS-99* or the *NTS-98* for the definition of a reportable transit injury.

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U.S. transit fatalities and injuries are obtained from the Federal Transit Administration's (FTA) National Transit Database (NTD) Reporting System. A transit agency is required to file a NTD report at regular intervals if it is a recipient of Urbanized Area Formula Funds. Some 400 transit agencies report, and because some agencies own and operate more than one form of transit, approximately 600 transit services are covered. Such transit operators are responsible for 90 to 95 percent of passenger kilometers traveled on transit. Other transit operators are encouraged to submit NTD forms. The transit operators report on fatalities, injuries, accidents, incidents, and property damage in excess of \$1,000. Electronic reporting has recently been implemented for the NTD. A certification from the Chief Executive Officers (CEO) must accompany all NTD reports along with an independent Auditor's Statement. When an NTD report is received, a validation process is set up, which includes a preliminary review of the data for completeness. The report is further reviewed and outstanding items are noted in writing to the agency that submitted the form.

Transit safety data are collected in four major categories: (1) collisions, (2) derailments/buses going off road, (3) personal casualties and (4) fires. The major categories are further broken down into subcategories. *Collisions* comprise collisions with vehicles, objects and people (except suicides). Of the four major categories, only the first two are included in the definition of *accident* adopted in the *National Transportation Statistics*. This definition of *accident* is relevant to understanding how double counting is removed in the overall total of U.S. transportation fatalities and injuries (see *Cross-Modal Comments*, above). The transit data presented in Tables

3-1 and 3-2 are for all incidents covering all four of the major categories of events listed above. Thus, for example, fatalities and injuries arising from a fall in a transit station or tripping while getting off a bus are counted. For more detail, the reader should consult U. S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics (SAMIS) Annual Report*.

*Water transport, recreational boats:* U.S. data for fatalities and injuries from recreational boating are based on required reports submitted to the U.S. Coast Guard. Federal regulations (U.S. Code of Federal Regulations 33 (CFR-33,173-4)) require the operator of any vessel that is numbered or used for recreational purposes to submit an accident report when, as a result of an occurrence involving the vessel or its equipment: (1) a person dies, (2) a person is injured and requires medical treatment beyond first aid, (3) damage to the vessel and other property totals more than \$500 or there is a complete loss of the vessel or (4) a person disappears from the vessel under circumstances that indicate death or injury. Although there is no quantitative estimate of the response rate, there may be considerable underreporting, especially of nonfatal accidents, because of the difficulty of enforcing the requirement and because boat operators may be apathetic to, or may not always be aware of, the law.

*Water transport, commercial vessels (passenger and freight):* Data in Table 3-1 and 3-2 include: (a) U.S. flag vessels operating *anywhere in the world* and (b) foreign flag vessels operating within the jurisdiction of the United States (within 12 miles or having an interaction with a U.S. entity, such as a platform within 200 miles or a collision with a U.S. ship.). U.S. territories and protectorates

are included. All deaths and injuries cited result from vessel casualties, such as groundings, collisions, fires or explosions. Fatalities include both people who died and those who were declared missing subsequent to a vessel casualty.

The fatality and injury numbers in Tables 3-1 and 3-2 are taken from marine casualty notifications to the Coast Guard required by the U.S. Code of Federal Regulations (46 CFR 4.05-1) for U.S. flag and foreign vessels, and the subsequent investigation reports. The 1990 data are taken from the casualty maintenance database (CASMAIN) and its personnel casualty table (PCAS). The 1995 and 1996 data are taken from the U.S. Coast Guard Marine Safety Information System (MSIS), and specifically from the Marine Investigations Module. MSIS, which captures marine safety data, is complemented by an analysis database, the Marine Safety Management System (MSMS).

In Tables 3-1 and 3-2, the categories *Commercial Passenger Vessels* and *Commercial Freight Vessels* correspond to the U.S. Coast Guard's categories of *Passenger Vessels* and *Cargo Vessels*, respectively. The Coast Guard defines passenger vessels as: "a vessel that carries passengers for hire domestically, and more than 12 passengers for hire on an international voyage. This includes uninspected passenger vessels, small passenger vessels, passenger and dinner cruise vessels, and cruise ships." The Coast Guard defines cargo vessels as: "a vessel that is engaged in commerce by carrying or facilitating the carrying of cargo. This category includes fishing vessels, but does not include mobile offshore drilling units. A cargo vessel on an international voyage may carry cargo and up to 12 passengers for hire." However, data disaggregated into *Passenger Vessels* and

*Cargo Vessels* were not readily available for this publication.

**Table 3-3**  
**Motor Vehicle Fatality and Injury Rates**

### Canada

Table 3-3 is based on the following primary sources:

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

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

Number of Road Motor Vehicles: Statistics Canada. *Road Motor Vehicles Registrations, Catalogue 53-219-XPB*. (Ottawa, Ont.: various years).

See notes under *Road* for Tables 3-1 and 3-2 for a discussion of how road fatality and injury data are collected. See notes under Table 8-1 for how vehicle-kilometer data are collected. See notes under Table 12-1 for how data on number of road vehicles are collected. Data for 1990, 1995 and 1996 motor vehicle injury and fatality rates per 100 million vehicle-kilometers are based on Transport Canada estimates of vehicle-kilometers traveled by passenger motor vehicles and light trucks during 1995. Estimates of vehicle-kilometers are based on: (1) road motor vehicle fuel sales (net sales on which taxes were paid at road-use rates); (2) estimates of fuel efficiency by class of vehicle; and (3) estimates of average occupancy. Data for motor vehicle injury and fatality rates per 10,000 registered vehicles are based on the number of registered motor vehicles for

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1990, 1995 and 1996 and include personal vehicles (personal passenger cars, motorcycles, light trucks) and commercial vehicles.

### **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**

Table 3-3 is based on a modification of a similar table published in the U. S. Department of Transportation, Bureau of Transportation Statistics. *National Transportation Statistics 1998 (NTS-98)*. (Washington, DC: 1998) and *National Transportation Statistics 1999 (NTS-990)* (Washington, DC: 1999). This table is based on the following primary sources:

U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 1997*. Washington, DC (November, 1998).

Fatalities: U.S. Department of Transportation.

National Highway Traffic Safety Administration (NHTSA). National Center for Statistics and Analysis. *Fatality Analysis Reporting System (FARS)*. (Washington, DC: 1998).

Injuries: U.S. Department of Transportation. National Highway Traffic Safety Administration (NHTSA). National Center for Statistics and Analysis. *General Estimates System (GES) and Fatality Analysis Reporting System (FARS) 1998*. (Washington, DC: 1998).

Vehicle-kilometers:

1990, 1995: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996). Table VM-201A.

1996: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Table VM-1.

Number of road motor vehicles:

1990: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996). Table VM-201A.

1995 and 1996: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Table VM-1.

See the notes under *Road* for Tables 3-1 and 3-2. As discussed there, a great deal of effort is devoted to getting a complete and accurate count of road fatalities on public roads. Consequently, the error in the fatality rate is dominated by the error in vehicle-kilometers, which currently can only be roughly estimated. (See notes under Table 12-1 for information on how data on the number of road vehicles are collected, and Table 12-2 for how the data on vehicle-kilometers

are collected.) The level of precision shown in Table 3-3 for the fatality rates is the level reported by the U.S. Department of Transportation National Highway Traffic Safety Administration in their summary document, *Traffic Safety Facts, 1997*.

Because the injury data come from a survey, they are subject to sampling error. See U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 1997*, Appendix C, Table of Standard Errors. For 3,000,000 injuries, the standard error is 5.3 percent.

**Table 3-4**  
**Air Carrier Fatality and Injury Rates**

**All Countries**

In order to forestall invalid conclusions based on the rates alone, standard deviations for the fatal accident rates and the fatality rates are estimated. The standard deviation for the injury rate is more difficult to estimate, and thus has been omitted. The standard deviation is a measure of predictability, assuming the system being measured does not change. If two numbers differ by three standard deviations or more, it can be said, with a very high level of confidence, that the two numbers are in fact different, and that the two systems they describe are in some way different. If two numbers differ by less than one standard deviation, all that can be concluded is that the numbers appear not to be different, and that the systems they describe have not been shown to be different.

*Type of aircraft:* In Table 3-4, and in the discussion that follows, only fatal accidents, fatalities and injuries involving large aircraft are considered. Each country defines the exact meaning of “large aircraft” in the individual country notes below.

*Calculation of standard deviations for fatal accidents (all countries):* There are several ways to estimate the standard deviation of a small number of uncorrelated events (e.g., 27 fatal accidents), using Poisson statistics. The results of the estimates differ somewhat, and the differences increase as the number decreases. In the discussion that follows, the simplest estimate is presented, for the sake of clarity. For the calculation of the standard deviations in the fatal accident rates in Table 3-4, a more sophisticated estimate has been used. However, **all the estimates lead to the same conclusion: the Canadian, U.S. and Mexican fatal accident rates differ by only about one standard deviation, or less.**

*Standard deviation, fatal accidents (United States):* The standard deviation for the number of fatal accidents is approximately plus or minus the square root of the number of fatal accidents. (As noted above, this is a simplification.) In the case of the United States, with 27 fatal accidents in 57 million flight segments, this means that if the air safety system remained unchanged for a very, very long period of time, it would be expected, to a 68 percent confidence level, that the average number of fatal accidents per 57 million flight segments would be between 22 and 32. Twenty-seven fatal accidents in 57 million flight segments gives a fatal accident rate of 0.047 fatal accidents per 100,000 flight segments. The standard deviation in the fatal accident rate is, in percentage terms, the same as the standard deviation in the number of fatal accidents. The square root of 27 is 19 percent of 27, and the standard deviation on the U.S. fatal accident rate of 0.047 is plus or minus (+/-) 19 percent of 0.047, or plus or minus (+/-) 0.009. The standard deviation given in Table 3-4 for the U.S.

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fatal accident rate is plus 0.010/minus 0.008. This is a result of a better estimate.

*Standard deviation, fatal accidents (Canada):* The standard deviation on the Canadian fatal accident rate is calculated in the same way as that for the United States. The difference between the simple calculation (standard deviation of +/-0.025) and the better estimate shown in Table 3-4 (+0.031, -0.021) is sizable, because the number of fatal accidents (7) is very small.

*Standard deviation, fatal accidents (Mexico):* The standard deviation on the Mexican fatal accident rate is more complicated to estimate. With only one fatal accident, the simple square root estimate breaks down completely, and with Poisson statistics the standard deviation (technically, the one sigma confidence limit on the mean) becomes highly asymmetric, smaller on the downside and bigger on the upside. In principle, the standard deviation on one fatal accident can be calculated, but has not been done for this table. However, it can be said, with absolute confidence, that the standard deviation on the Mexican fatal accident rate (0.047) based on one fatal accident is not only bigger, but much bigger, than the standard deviation (+0.010, -0.008) on the U.S. fatal accident rate (0.047) based on 27 fatal accidents.

*Calculation of standard deviations for fatality rates (all countries):* **If** all accidents had the same number of fatalities, then the standard deviation on the fatality rate would be, in percentage terms, the same as the standard deviation on the fatal accident rate. That is (to continue with the simplified calculation), if the United States' 922 fatalities had occurred in 27 accidents with 34 fatalities each, then the standard deviation on the fatality rate would be slightly less than 20

percent. (The square root of 27 is 19.2 percent of 27.)

However, in the case of the United States, 16 of the 27 accidents had fewer than 10 fatalities each, and nearly 70 percent of the fatalities occurred in 4 accidents, each of which killed more than 100 people. In the case of Canada, 6 of the 7 fatal accidents had fewer than 10 fatalities each; the seventh claimed 261 lives. In statistical terminology, the number of fatalities is highly correlated with the number of **large** fatal accidents, and the standard deviation on the fatality rate is thus dominated by the standard deviation on the rate of **large** fatal accidents. Thus, to calculate the standard deviations on the U.S. and Canadian fatality rates correctly, it would be necessary to calculate the "large fatal accident rates" and their standard deviations for the two countries. This would mean calculating the standard deviation on one large fatal accident for Canada (and on four large fatal accidents for the United States.) This has not been done for this table. Instead, a gross underestimate has been used: that the standard deviation on the fatality rate is the same, in percentage terms, as the standard deviation on the fatal accident rate. When this is done, the U.S. and Canadian fatality rates differ by about one standard deviation. To repeat: the actual standard deviations are much larger than this crude estimate, and so **the Canadian and U.S. fatality rates differ by less than one standard deviation.**

Mexico had no large fatal air accidents during the 4-year period for which it has data, and therefore, a standard deviation for the Mexican fatality rate has not been estimated, for this table. **Without a standard deviation, no statistically meaningful comparison can be made between the Mexican fatality rate and the U.S. or Canadian**

**fatality rate.** In statistical terms, the “large fatal accident rate” for Mexico is **not** zero, but is smaller than some number to a given level of confidence, and can, in principle, be calculated from Poisson statistics. That is, even though Mexico had no large fatal accidents in 4 years and over 2 million flight segments, it cannot be stated that Mexico will never have a large fatal accident. If the U.S. data are examined, it can be seen that there have been several periods when the United States had no large fatal accidents. For example, in 1993 the United States had no large fatal accidents, and over 8 million flight segments were flown. In 1997 and 1998, the United States had no large fatal accidents, and over 20 million flight segments were flown during those 2 years. During the 1990 to 1996 period, Canada had only one large fatal accident (in 1991), and thus has gone at least 5 years and over 7 million flight segments without a large fatal accident. Even if the standard deviation (i.e., the one sigma confidence limit on the mean) for the Mexican “large fatal accident rate” were estimated, a series of assumptions would have to be made to estimate the corresponding standard deviation on the fatality rate, and this would be statistically questionable. Thus, this calculation has not been attempted.

### Canada

Table 3-4 is based on the following primary sources:

Air Carrier Fatal Accidents, Fatalities and Injuries: Transportation Safety Board of Canada. Special tabulation. (Ottawa, Ont.: 1998).

Air Carrier Flight Operations: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998).

The Canadian air carrier data in Table 3-4 differ from the air carrier data in Tables 3-1 and 3-2. The air carrier data in Tables 3-1 and 3-2 present combined fatality and injury data for Canadian air carriers, commuter aircraft and air taxis/specialty aircraft. (See definitions under Tables 3-1 and 3-2.) Table 3-4 presents fatality, injury and flight segment data *only* for airliners (as defined by the Transportation Safety Board of Canada) that are operated by Canadian Level I and II air carriers. Canadian Level I and Level II operators include all air carriers that, in each of the 2 calendar years immediately preceding the report year, transported at least 50,000 revenue passengers or at least 10,000 metric tons of revenue goods. In Tables 3-1, 3-2 and 3-4, Canadian data cover only Canadian registered aircraft operated by Canadian carriers, and include both domestic and international flights, both scheduled and nonscheduled operations, and both passenger and all-cargo flights. Accidents that result in fatalities on the ground, but not on the aircraft, are not counted as fatal accidents. Fatalities and injuries on the ground are not counted. Also see the definitions of aviation accidents, fatalities and serious injuries for Tables 3-1 and 3-2.

### 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).

*Number of fatal accidents, fatalities and injuries:* Data include only commercial aircraft that are operated by Mexican flag carriers, and that have 30 seats or more, or an equivalent freight capacity. Both domestic and international flights are included.

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*Flight segments:* The number of flight operations was estimated as the sum of take-offs plus landings divided by two, for scheduled and nonscheduled commercial aviation, in airports under the administration of Aeropuertos y Servicios Auxiliares. Note that some nonscheduled commercial aviation operations are performed at airports not under ASA's administration. Moreover, some scheduled Mexican aviation operations are performed at airports outside Mexico. These two factors cause the estimate of the number of flight operations to be lower than they actually are, thereby increasing the rates above their true values.

### United States

Table 3-4 is based on a modification of a similar table published in the U.S. Department of Transportation Bureau of Transportation Statistics. *National Transportation Statistics 1998*. (Washington, DC: 1998) and *National Transportation Statistics 1999* (Washington, DC: 1999).

This table is based on the following primary sources:

National Transportation Safety Board. *Annual Review of Aircraft Accident Data*, annual issues and *NTSB Press Release, SB97-03*. (Washington, DC: various years).

National Transportation Safety Board (NTSB). Analysis and Data Division, RE-50. (Washington, DC: 1998).

National Transportation Safety Board. *Aviation Accident Statistics*. Web site: [www.ntsب.gov/aviation/Stats.htm](http://www.ntsب.gov/aviation/Stats.htm)

National Transportation Safety Board. *Accident Synopses*. Web site: [www.ntsб.gov/aviation/Accident.htm](http://www.ntsب.gov/aviation/Accident.htm)

See also: U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation 1996*. (Washington, DC: 1997). Chapter 9. Web site: [www.api.hq.faa.gov/handbook/1996/toc96.htm](http://www.api.hq.faa.gov/handbook/1996/toc96.htm)

The air carrier data in this table differ from the air carrier data in Tables 3-1 and 3-2. The data in this table include only commercial aircraft that are operated by U.S. flag air carriers, and that have more than 30 seats or that have a maximum payload capacity of more than 7,500 pounds (3,402 kg). These aircraft are regulated under the U.S. Code of Federal Regulations 121 (14 CFR 121). In contrast, the air carrier data in Tables 3-1 and 3-2 include not only these larger aircraft, but smaller aircraft (commuters and on-demand air taxis) that are regulated under the U.S. Code of Federal Regulations 135 (14 CFR 135). In all three tables, the U.S. data cover only aircraft operated by U.S. flag carriers, and include both domestic and international flights, both scheduled and nonscheduled operations, and both passenger and all-cargo flights. Because the regulations for the larger aircraft differ from the regulations for the smaller aircraft, it is not instructive to combine the two categories in calculating safety rates. It should also be noted that during the research phase of this project, a change in regulations occurred. Since March 20, 1997, 14 CFR-121 began to cover some smaller aircraft (i.e., aircraft with 10 or more seats) that were formerly regulated under 14 CFR-135. This change does not affect the data in this publication, because of its 1996 cutoff.

Also see the notes under *Air* for Tables 3-1 and 3-2. As discussed there, the count of fatal accidents and fatalities is complete and

highly accurate. The exposure data (i.e., the number of flight segments) are based on a 100 percent reporting by the airlines to the U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information. Therefore, statistical fluctuation dominates the standard deviations. (Also see the section on *Calculation of Standard Deviations*, above.)

## SECTION 4: TRANSPORTATION, ENERGY AND THE ENVIRONMENT

**Table 4-1**  
**Energy Consumption by the**  
**Transportation Sector**

### Canada

Statistics Canada. *Quarterly Report on Energy Supply-Demand in Canada, Catalogue 57-003-XPB*. (Ottawa, Ont.: various editions).

Figures for total energy consumption include renewable energy. Total energy consumption also includes all electricity production, including electrical system energy losses. Data for total transportation energy consumption include fuel used in fisheries and in private trucking, but excludes fuel consumption by public administrations. The electricity component of transportation energy consumption excludes electrical system energy losses. Natural Gas data include gas plants and Natural Gas Liquids (NGLs). Natural gas volumes were converted from units of trillion of cubic feet to units of trillion cubic meters using a conversion factor of 0.02832. Petroleum data include energy from petroleum products. Petroleum data exclude energy derived from crude oil.

### Mexico

Secretaría de Energía. *Balance Nacional, Energía. 1996*. (Mexico City, D.F.: 1998).

Data on total energy consumption include losses resulting from the transformation of one form of energy to another, self-consumption (principally at electrical power plants), and the transportation, distribution and storage of fuels and electricity. These losses add up to 1.63 exajoules (1990), 1.68 exajoules (1995) and 1.86 exajoules (1996). For each year, consumption of liquefied petroleum gases (LPG) accounts for about 1.5 percent of the total.

### United States

Table 4-1 is based on a modification of a similar table published in the U.S. Department of Energy, Energy Information Administration's *Annual Energy Review*. This table is based on the following primary sources:

Energy consumption and transportation, total: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review 1997*. (Washington, DC: 1998). Table 2.1

Transportation consumption of natural gas, petroleum and electricity and transportation electrical system losses: U.S. Department of Energy. Energy Information Administration. *Monthly Energy Review, August 1998*. (Washington, DC: 1998). Table 2.5.

Natural gas (trillion cubic meters): U.S. Department of Energy. Energy Information Administration. *Annual Energy Review 1997*. (Washington, DC: 1998). Table 6.6.

Petroleum (million barrels): U.S. Department of Energy. Energy Information Administration. *Annual Energy Review 1997*. (Washington, DC: 1998). Table 5.12b.

*Energy consumption, total*: Data include electrical system losses (production, transmission and distribution). In exajoules, these are 21.5 for 1990; 23.0 for 1995 and 23.7 for

1996. (Data are from the Department of Energy's *Annual Energy Review*, Table 2.1). Total energy consumption also includes renewable energy used by electrical utilities and residential, commercial, industrial users and transportation. The Energy Information Administration (EIA) at the Department of Energy uses the higher heating values (gross heat content) of fossil fuels in arriving at total energy consumption; that is, the energy in the fuel spent vaporizing the water produced by the burning of the fuel is counted.

*Transportation consumption, total:* Data **do not** include electrical system energy losses. In exajoules, these are 0.033 for 1990; 0.028 for 1995 and 0.030 for 1996. The transportation total also includes about 0.1 exajoule each year in the form of ethanol blended into motor gasoline. This is, by far, the largest use of renewables in transportation. (See Table 4-3.) In this table, fisheries are not included in transportation.

*Conversions:* To convert from barrels of petroleum to exajoules: One barrel of petroleum has a heat content of approximately 5.74 billion (thousand million) joules (from the Department of Energy's *Annual Energy Review*, Table A3). To convert from cubic meters of natural gas to exajoules: one cubic meter of natural gas has a heat content of approximately 38.3 million joules (from the Department of Energy's *Annual Energy Review*, Table A4.)

## **Table 4-2 Energy Consumption by Mode of Transportation**

### **Canada**

Table 4-2 is based on the following primary sources:

All modes, except transit rail: Statistics Canada. *Quarterly Report on Energy Supply-Demand in Canada, Catalogue 57-003-XPB*. (Ottawa, Ont.: various quarterly editions).

Natural resources Canada. *Canada's Energy Outlook 1996-2020*. (Ottawa, Ont.: 1998).

Transit rail: Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue 53-215-XPB*. (Ottawa, Ont.: various years).

Air fuel data include sales to foreign carriers, but exclude fuel purchased by Canadian carriers abroad. Data for road, other fuels refer to liquid petroleum gases (LPGs). Rail fuel data are for diesel fuel only. Transit fuel data refer to all urban public transit, including local motor buses, light rail and heavy rail. Data for water transport fuel include fuel sold to fisheries operators. Water data also include sales to foreign carriers, but exclude fuel purchased by Canadian carriers abroad.

### **Mexico**

Secretaría de Energía. *Balance Nacional, Energía 1996*. (Mexico City, D.F.: 1998).

Comisión Nacional para el Ahorro de Energía. Private communication. (Mexico City, D.F.: 1998).

Starting in 1991, diesel was gradually substituted for residual fuel oil for water transport. As shown by the data in the table, this substitution was almost complete by 1995.

### **United States**

Table 4-2 is based on the following primary sources:

Total Transportation Energy Consumption: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review 1997*. (Washington, DC: 1998). Table 2.1.

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**Air:**

**Jet fuel:** U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. Private Communication, based on Form 41 Financial Reports submitted by the large certificated air carriers to DOT under CFR 241. (Washington, DC: 1998). (See notes for the definition of “large certificated air carriers.”)

U.S. Department of Transportation. Federal Aviation Administration. *General Aviation and Avionics Survey*. (Washington, DC: various years). Table 5.1.

**Aviation gasoline:** U.S. Department of Transportation. Federal Aviation Administration. *General Aviation and Avionics Survey*. (Washington, DC: various years). Table 5.1.

**Road, gasoline and diesel:**

**1990, 1995:** U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996). Table MF-221.

**1996:** U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Table MF-21.

**Road, other fuels:** U.S. Department of Energy. Energy Information Administration. *Alternatives to Traditional Transportation Fuels, 1996*. (Washington, DC: 1997). Table 10.

**Pipeline:** U.S. Department of Energy. *Natural Gas Annual 1996*. (Washington, DC: 1997). Table 101 and similar tables in earlier editions.

**Freight rail:** Association of American Railroads. *Railroad Facts, 1997 Edition*. (Washington, DC: 1997). Page 40.

**Intercity passenger rail:**

**1990:** National Railroad Passenger Corp. State and Local Affairs Department. Private Communication. (Washington, DC: 1998).

**1995, 1996:** National Railroad Passenger Corp. Director of Fuel Management. Private Communication. (Washington, DC: 1998).

**Transit rail:** American Public Transit Association. *Transit Fact Book*. (Washington, DC: various years).

American Public Transit Association. Private Communication. (Washington, DC: 1998).

**Water transport:**

**Residual and distillate/diesel fuel oil:** U.S. Department of Energy. Energy Information Administration. *Fuel Oil and Kerosene Sales*. (Washington, DC: various years). Tables 2 and 4 and similar tables in earlier editions.

**Gasoline:** U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Table MF-24 and similar tables in earlier editions.

**Total fuel consumption:** Data differ from the sum of the rows, because the total comes from the U.S. Department of Energy, which is more inclusive than the U.S. Department of Transportation, the source of much of the individual modal data in the table. The total is larger than the sum of the modal categories in Table 3-2 by 1.44 exajoules in 1996; by 1.37 exajoules in 1995; and 1.55 exajoules in 1990.

There are two second-order corrections to these discrepancies. First, fuel consumed by local transit buses and other road transit vehicles is reported both under road and under transit. For each year, this *increases* the discrepancy by roughly 0.1 exajoules. Second, U.S. data are unavailable for the amount of electricity and diesel used to

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transport the contents of pipelines. Using the Canadian pipeline data as a guide, including pipeline electricity and diesel for the U.S. would *reduce* the discrepancy by roughly 0.1 exajoules (including energy system losses) for each of the 3 years. Thus, these two second-order corrections are both small, are in the opposite direction, and can therefore be neglected.

A rigorous reconciliation between the Department of Energy and Department of Transportation data is beyond the scope of these notes. However, DOE's *Annual Energy Review*, Table 5.12b reports jet fuel consumption of 3.32 exajoules for 1990, 3.30 exajoules for 1995 and 3.46 exajoules for 1996. These are between 1.4 and 1.5 exajoules larger than the jet fuel numbers in Table 4-2, almost exactly the amount of the discrepancy. The DOE figures include jet fuel consumed by the military, by other federal agencies, by foreign carriers fueling in the U.S. and by all U.S. air carriers, not just those meeting the definition of a "large certificated carrier." (See Air, below, for a more complete definition of what is included under jet fuel in Table 4-2.)

Other items are left out of the individual modal numbers in Table 4-2. Nonclass I rail is not included, nor are electrical system losses for rail and transit. Military use of gasoline is left out of the road category in Table 4-2. (Federal civilian use of gasoline is included, as are state, county and municipal use.) Nor are losses arising from the evaporation and handling of road gasoline included in the road category in Table 4-2. All governmental use of diesel road fuel is left out of FHWA's category "Special Fuels," and thus is left out of Table 4-2. All of these together probably add up to less than 0.5 exajoules. (See *NTS-99*, Table 4-19 and he

*Annual Energy Review-1997*, Tables 1-12 and 1-13 for data on military use of energy.)

*Air, jet fuel:* Data include *only* jet fuel consumed by the large certificated carriers *in their domestic operations*, plus on-demand air taxis and general aviation. Large certificated carriers account for 95 percent to 96 percent of the jet fuel reported in Table 4-2. A *large certificated air carrier* is an air carrier "holding a certificate issued under Section 401 of the Federal Aviation Act of 1958, as amended, that: (1) operates aircraft designed to have a maximum passenger capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds [8,165 kg]; or (2) conducts operations where one or both terminals of a flight stage are outside the 50 states of the United States, the District of Columbia, the Commonwealth of Puerto Rico and the U.S. Virgin Islands." The large certificated air carriers are divided into four groups, according to operating revenue: Majors, Nationals, Large Regionals and Medium Regionals. The jet fuel data in Table 4-2 exclude the Medium Regionals, small certificated air carriers, scheduled commuters, foreign airliners fueling in the United States, the military and other governmental users.

*Road:* Gasoline includes private, commercial and governmental use, with the exception of the military. The Federal Highway Administration's category "Special Fuels" appears to exclude civilian government and military use. (See *Highway Statistics*, cited above.) More than 99 percent of FHWA's category "Special Fuels" is diesel. Data for the category "Other Fuels" in Table 4-2 are taken directly from the "Total Alternative Fuels" category of Table 4-3; the conversion factor used is that for gasoline, because the data in Table 4-3 are stated as gasoline-equivalent liters.

*Transit:* Data cover all transit, including local transit buses and other road transit vehicles, which also are reported under Road. Some ferryboats, however, are not included. (Web site: [www.apta.com/](http://www.apta.com/), click on Statistics.) For 1995 and 1996, the entry "Gasoline" includes all nondiesel fuels, except for compressed natural gas (CNG). (On a volume basis, gasoline accounted for about 70 percent of the entry "Gasoline" in 1995 and 1996.) For 1990, the entry "Gasoline" includes only gasoline.

*Conversion factors:* See *NTS-99*, Table 4-6 for the volume-to-energy conversion factors. The *NTS* conversion factors are in U.S. measurements (BTUs per gallon). Multiply the factors by 278.7 to get joules per liter.

**Table 4-3**  
**Estimated Consumption of Alternative and Replacement Fuels for Road Motor Vehicles**

**Canada**

Natural Resources Canada. Office of Energy Efficiency. (Ottawa, Ont.: 1998).

**Mexico**

The principal alternative fuel in Mexico for the years reported is liquified petroleum gases (LPG). As a motor fuel, LPG is used mainly in cities by commercial light-duty trucks, as a result of private custom-fitting.

**United States**

Table 4-3 is taken from the following primary source, with only a change from gallons to liters: U.S. Department of Energy. Energy Information Administration. *Alternatives to Traditional Transportation Fuels, 1996*. (Washington, DC: 1997). Table 10.

*Fuel consumption, total:* The total represents the sum of alternative fuels, gasoline and diesel. The oxygenates are included in gasoline.

*Methanol and ethanol:* The remaining portion of 85-percent methanol and both ethanol fuels is gasoline. Consumption data include the gasoline portion of the fuel.

*MTBE:* Data include a very small amount of other ethers.

*Gasoline:* Data include MBTE and ethanol in gasohol.

*Data definitions and sources:* In the United States, the definitions for alternate fuels and replacement fuels are set by Section 301 of the Energy Policy Act of 1992, and are summarized in the annual U.S. Department of Energy, Energy Information Administration publication, *Alternatives to Traditional Transportation Fuels*.

In Table 4-3, U.S. fuel quantities are expressed as gasoline-equivalent liters (gallons) to allow direct comparisons among different types of fuel. According to *Alternatives to Traditional Transportation Fuels*, the gasoline equivalent is computed by dividing the lower heating value of the alternative fuel by the lower heating value of gasoline and multiplying the quotient by the volume of alternative fuel consumed. Lower heating value is the joule content per unit of fuel, excluding the heat produced by condensation of water vapor in the fuel.

Table 4-3 is taken *directly* from *Alternatives to Traditional Transportation Fuels*, with only a simple conversion from gallons to liters. *Alternatives to Traditional Transportation Fuels* describes in some detail how consumption values for the various alternative fuels are calculated. Briefly, the consumption of alternative fuels in a given year is estimated

from the numbers of different kinds of alternative-fueled vehicles in operation in that year, the annual average vehicle-miles-traveled (vmt) for equivalent conventional vehicles, and estimates of fuel efficiency. The vmt is adjusted downward for the alternative fueled vehicles, to allow for less intensive use of alternative-fueled vehicles relative to conventional vehicles.

Oxygenate consumption is "estimated from production, net imports and stock change data from the Department of Energy's *Petroleum Supply Monthly*. *Petroleum Supply Monthly* compiles data from the Monthly Petroleum Supply Reporting System, a series of surveys that collect data from refiners, importers and transporters of crude oil and petroleum products. Oxygenate data also are collected on DOE's *Monthly Oxygenate Telephone Report*.

For Table 4-3, the Energy Information Administration at DOE took gasoline and diesel consumption from the *EIA Petroleum Supply Annual, Volume 1* (June 1997). Highway use of gasoline was estimated as 97.1 percent of total gasoline use, and highway use of diesel was estimated as 52.1 percent of total diesel consumption.

*Differences with Table 4-2:* The values for road gasoline and road diesel in Table 4-3 differ slightly from the values in Table 4-2. (See the notes under Table 4-2 for a brief description of the origin of the numbers in Table 4-2.) When the values in Table 4-2 are expressed in volume terms, road gasoline is 1.5 percent higher in Table 4-2 than in Table 4-3 for 1996 and 1.0 percent higher for 1995. The values for road diesel also differ slightly between the two tables. (Note that diesel in Table 4-3 is in gasoline-equivalent volume units, not in actual volume of diesel fuel.)

**Table 4-4**  
**Average Price of Fossil Fuel to End-Users**

(Current U.S. cents per liter)

**Canada**

Natural Resources Canada. Office of Energy Efficiency. (Ottawa, Ont.: 1998).

**Mexico**

Petróleos Mexicanos. *Anuario Estadístico, 1998*. (Mexico City, D.F.: 1999).

Petróleos Mexicanos. PEMEX-Refinación. Subgerencia de Planeación (Mexico City, D.F.: 1999)

For further information, see: *Tasas para el Cálculo del Impuesto Especial sobre Producción y Servicios para la Enajenación de Gasolinas y Diesel* (*The Federal Register, Rates to Estimate the Special Tax on Production and Services for the Sale of Gasoline and Diesel*); and the *Ley del Impuesto Especial sobre Producción y Servicios* (*Special Tax on Production and Services Act*).

All prices are those in effect at the end of December of each year. At present there are 86 authorized fuel dealer stations in Mexico. Each month, the Secretaría de Hacienda y Crédito Público publishes in the *Diario Oficial de la Federación* (*Federal Register*) the rates relative to the Impuesto Especial sobre Producción y Servicio (Special Tax on Production and Services) for the sale of gasoline and diesel. The rates range from 25-30 percent on average.

After the Special Tax Rate is added to the reference price, the Value Added Tax (VAT) is added. For some gas stations, the VAT is 10 percent; for others it is 15 percent. The sum of the reference price, the Special Tax and the VAT becomes the price at the gas station.

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## United States

Table 4-4 is based on the following primary sources:

Motor vehicle fuel: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review 1997*. (Washington, DC: 1998). Table 5.22.

Motor vehicle fuel taxes: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996). Tables FE 101A, MF 205 and MF 202.

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Tables FE 101A, MF-205, MF-121T (second page) and MF2.

### Aviation fuel:

Gasoline: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review, 1997*. (Washington, DC: 1998). Table 5.20.

Jet fuel: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. Private Communication, based on Form 41 Financial Reports submitted by the large certificated air carriers to DOT under CFR-241. (See notes for Table 4-2 for the definition of "large certificated air carriers.") (Washington, DC: 1998).

See also: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review, 1997*. (Washington, DC: 1998). Table 5.20.

Rail fuel: Association of American Railroads. *Railroad Facts, 1997 Edition*. (Washington, DC: 1997). Page 60.

Rail fuel taxes: Association of American Railroads. Private Communication. (Washington, DC: 1998).

Water transport: U.S. Department of Transportation. Maritime Administration (MARAD). Private Communication, based on reports from major U.S. flag liner operators to MARAD. (Washington, DC: 1998).

For information on U.S. federal fuel taxes, see: U.S. Internal Revenue Service, *Fuel Taxes* at [www.irs.ustreas.gov/prod/forms\\_pubs/pubs/p51005.htm](http://www.irs.ustreas.gov/prod/forms_pubs/pubs/p51005.htm)

*Data sources for road gasoline and diesel and aviation gasoline:* For more information on methods of data collection and a discussion of sources and sizes of errors, see U.S. Department of Energy, Energy Information Administration, *Weekly Petroleum Status Report*, Appendix A, available through Department of Energy's Energy Information Administration's web site: [www.eia.doe.gov](http://www.eia.doe.gov)

*Motor vehicle fuel, gasoline and diesel:* Average gasoline prices by grade are calculated by the U.S. Department of Energy, Energy Information Administration (EIA) "from a sample of service stations providing all types of service (i.e., full-, mini- and self-service) and geographic coverage for 85 urban areas." The averages are simple annual averages of monthly data from the U.S. Department of Labor, Bureau of Labor Statistics, *Consumer Prices: Energy*.

Diesel prices are derived from an EIA telephone survey of a selected sample of 350 retail on-highway diesel fuel outlets. The survey is from *EIA-888, On-Highway Diesel Fuel Price Survey*. According to the EIA, the average prices are calculated from pump prices, and therefore include all taxes, federal and state, plus state sales taxes for those states that have sales taxes on road fuel.

All 50 states, plus the District of Columbia, have a per-gallon tax on both road gasoline and road diesel, but only a few states have a

sales tax on these fuels. See *Highway Statistics 1996*, Table MF 121T for state per-gallon and sales taxes on road gasoline, diesel, LPG and gasohol, and for information on the special provisions some states apply to some road fuel users. Furthermore, some users are exempt from federal road fuel taxes; others pay a reduced rate. See *Highway Statistics 1996*, Table FE101A for exemptions and reductions to the federal road fuel tax.

*Road gasoline and diesel taxes:* Gasoline and diesel taxes for 1990, 1995 and 1996 are provided in the two tables below. In 1998, the federal fuel taxes on road gasoline and road diesel were 18.4 cents per gallon (4.9 cents per liter) and 24.4 cents per gallon (6.4 cents per liter), respectively.

|      | <u>Gasoline taxes</u>     |        |       | <u>(Cents per liter)</u> |        |       |
|------|---------------------------|--------|-------|--------------------------|--------|-------|
|      | <u>(Cents per gallon)</u> |        | Total | <u>(Cents per liter)</u> |        | Total |
|      | Federal                   | State* |       | Federal                  | State* |       |
| 1990 | **9.1                     | 15.47  | 24.57 | **2.4                    | 4.1    | 6.5   |
| 1995 | 18.4                      | 18.50  | 36.90 | 4.9                      | 4.9    | 9.7   |
| 1996 | 18.3                      | 18.67  | 36.97 | 4.8                      | 4.9    | 9.8   |

\* State tax rates as of December 31st of each year. Weighted average based on net gallons taxed.

\*\* Applies to the first 11 months of 1990. Taxes went up by 5.0 cents per gallon (1.3 cents per liter) for both gasoline and diesel on December 1, 1990.

|      | <u>Diesel taxes</u>       |        |       | <u>(Cents per liter)</u> |        |       |
|------|---------------------------|--------|-------|--------------------------|--------|-------|
|      | <u>(Cents per gallon)</u> |        | Total | <u>(Cents per liter)</u> |        | Total |
|      | Federal                   | State* |       | Federal                  | State* |       |
| 1990 | **15.1                    | 16.00  | 31.10 | **4.0                    | 4.2    | 8.2   |
| 1995 | 24.4                      | 18.98  | 43.38 | 6.4                      | 5.0    | 11.5  |
| 1996 | 24.3                      | 18.99  | 43.29 | 6.4                      | 5.0    | 11.4  |

\* State tax rates as of December 31st of each year. Weighted average based on net gallons taxed.

\*\* Applies to the first 11 months of 1990. Taxes went up by 5.0 cents per gallon (1.3 cents per liter) for both gasoline and diesel on December 1, 1990.

*Aviation fuel, gasoline:* Data for aviation fuel gasoline represent the sales price to end-users. Prices are collected through the Energy Information Administration's 782A Survey, which "consists of a census of respondents who either directly or indirectly control a refinery or gas plant facility. As of October 1998, 155 companies respond to the EIA-782A survey. The survey results are reported in EIA's *Refiners'/Gas Plant Operators' Monthly Petroleum Product Sales Report*. The data on aviation fuel in Table 4-4 do not include any taxes. The federal tax on aviation gasoline in 1998 was 5.1 cents per liter (i.e., 19.4 cents per gallon).

*Aviation fuel, jet fuel:* The data are the basic cost of fuel reported to the DOT by the large certificated air carriers for their domestic operations. These carriers are defined under *Air* in technical notes for Table 4-2. Federal taxes are not included, nor are state taxes, nor are the "into-plane fees" (which are servicing charges by the fueling company). The federal tax on aviation fuel ("other than gasoline or diesel fuel") in 1998 was 5.8 cents per liter (i.e., 21.9 cents per gallon), but, the tax was reduced to 1.2 cents per liter (i.e., 4.4 cents per gallon) to commercial airlines meeting certain specifications and the tax was not applied to domestic air carriers engaged in foreign trade or trade between the United States and any of its territories. There are also other exemptions, reductions and special provisions. For more information, see the U.S. Internal Revenue Service publication *Fuel Taxes* at [www.irs.ustreas.gov/prod/forms\\_pubs/pubs/p51005.htm](http://www.irs.ustreas.gov/prod/forms_pubs/pubs/p51005.htm)

*Rail fuel, diesel:* The numbers in Table 4-4 are the costs of diesel fuel to the Class I freight railroads, as reported by the railroads. In 1996, the Class I railroads had operating rev-

enues of \$255.0 million or more. Although Class I railroads comprise only 2 percent of the number of railroads in the U.S., they accounted for 91 percent of railroad freight revenues in 1996. The data in Table 4-4 include federal taxes as follows:

- 1990: 0.10 cents per gallon through 11/30/90 (0.03 cents per liter)  
2.60 cents per gallon remainder of 1990 (0.69 cents per liter)
- 1995: 6.90 cents per gallon through 9/30/95 (1.82 cents per liter)  
5.65 cents per gallon remainder of 1995 (1.49 cents per liter)
- 1996: 5.55 cents per gallon (1.47 cents per liter)

State fuel taxes are not included in the railroad data in Table 4-4. The railroads are not required to report state fuel taxes as such, and summary data are not available because of the great variety of state levies on rail diesel fuel.

*Water transport, combined fuels:* The data in Table 4-4 include taxes for maritime fuel, but the federal tax is applied only in restricted circumstances. In 1998, the federal tax was 6.4 cents per liter (i.e., 24.4 cents per gallon) and "is imposed on any liquid fuel used in the propulsion system of commercial transportation vessels while travelling on certain inland and intracoastal waterways. The tax generally applies to all types of vessels, including ships, barges and tugboats." The fuel tax waterways are defined in Section 206 of the Inland Waterways Revenue Act of 1978 (P.L. 95-502), as amended by the Water Resources Development Act of 1986 (P.L. 96-662). Fuel tax waterways comprise 10,867 miles of commercially significant shallow draft inland waterways. Certain types of

transportation on these fuel-tax waterways are excluded from the tax. The IRS publication *Fuel Taxes* explains when the following are exempt: fishing vessels; deep-draft (more than 12 feet) ocean-going vessels; passenger vessels; ocean-going barges; and vessels operated by state, local and Indian tribal governments. For more detail, see *Fuel Taxes*.

**Table 4-5**  
**New Model Year Fuel Efficiency for Road Motor Vehicles**

**Canada**

Table 4-5 is based on the following primary sources:

Sales weighted averages: Transport Canada. *Transportation in Canada, 1997-Annual Report, TP 13198*. (Ottawa, Ont.: 1998).

Ranges: Natural Resources Canada. *Canada's Energy Outlook 1996-2020*. (Ottawa, Ont.: 1997). Transport Canada and Natural Resources Canada. *Fuel Consumption Guide, Annual*. (Ottawa, Ont.: various years).

**Mexico**

Secretaría de Energía. Comisión Nacional para el Ahorro de Energía, Dirección de Transporte. (Mexico City, D.F.: 1998).

Data are estimates from the Transportation Directorate of the Comisión Nacional para el Ahorro de Energía (National Commission for Energy Conservation).

**United States**

Table 4-5 is based on the following primary sources:

Sales weighted average new vehicle fuel efficiency (model year production):

U.S. Department of Transportation. National Highway Traffic Safety Administration

(NHTSA). Consumer Programs Division, NPS-32. (Based on the U.S. Environmental Protection Agency's Calculations of Final Fuel Economy for NHTSA). (Washington, DC: 1998).

U.S. Department of Transportation. National Highway Traffic Safety Administration (NHTSA). Automotive Fuel Economy Program. *Twenty-second Annual Report to Congress (Calendar Year 1997)*, and previous years. (Washington, DC: various years).

Ranges: U.S. Department of Transportation. National Highway Traffic Safety Administration (NHTSA). Consumer Programs Division, NPS-32. Private Communication. (Washington, DC: 1998).

*New vehicle fuel efficiency: background:* The U.S. Congress mandated the setting of fuel efficiency standards for new passenger cars and light trucks in the Energy Policy and Conservation Act (EPCA) of 1975 (49 USC 329). (Light trucks are defined for this purpose as 3,856 kg gross vehicle weight rating or less—i.e., 8,500 pounds or less.) These are the Corporate Average Fleet Economy (CAFE) standards. The Congress set specific numbers for the standards for 1985 and beyond (and for several earlier years) for passenger cars, but left the standards for light trucks to the discretion of the Department of Transportation (DOT). EPCA also gave DOT the authority to alter the standards for passenger cars.

To summarize, Congress assigned authority to DOT to: (1) set fuel efficiency standards for light trucks, (2) alter standards for passenger cars and (3) collect fines from manufacturers. Congress assigned this authority to DOT rather than to the Department of Energy (DOE) or the Environmental Protection Agency (EPA) because DOT already regulated the safety aspects of motor vehicles, and

Congress was concerned that the drive for high fuel economy would impact safety. Thus, Congress decided that fuel economy and safety should be regulated by the same agency. DOT then assigned fuel efficiency regulation to the National Highway Safety Administration (NHTSA) because NHTSA was the only modal administration that regulated light motor vehicles.

*New vehicle fuel efficiency numbers in Table 4-5:* The sales-weighted averages for the model year production were calculated by EPA for NHTSA, using sales figures from the manufacturers, mileage test values from the manufacturers, and the results of EPA's own mileage tests. EPA also monitors the mileage-testing programs of the manufacturers. The tests are performed on fully assembled cars, using dynamometers (i.e., not on-road tests), with a program that simulates a defined road course. The averages assume 55 percent city and 45 percent highway mileage. The averages include both domestic and imported vehicles. For more data and information, see U.S.DOT/NHTSA Automotive Fuel Economy Program, *Annual Report to Congress*.

*Ranges:* The lowest-fuel-economy and highest-fuel economy values are not the fuel economies for an entire car-line, but only for a specific engine and transmission option. Both domestic and imported vehicles are represented in the extreme values. Only gasoline-fueled vehicles are represented in the extreme values; for 1996, a light truck capable of running on compressed natural gas had a calculated *gasoline* fuel economy of 1.6 liters/100 km, but this vehicle was omitted from the ranges reported in this table.

### **Tables 4-6a and 4-6b Federal Emission Control Requirements for Passenger Cars and Light Trucks: Model Year**

### **Federal Emission Control Requirements for Heavy Trucks: Model Year**

#### **Canada**

Tables 4-6a and 4-6b are based on the following primary source: Transport Canada. Road Safety and Motor Vehicle Regulations Directorate. (Ottawa, Ont.: 1998).

#### **Mexico**

Instituto Nacional de Ecología. *Diario Oficial de la Federación. Norma Oficial Mexicana. NOM-042-ECOL-1993*. (Mexico City, D.F.: 1993).

Secretaría de Medio Ambiente, Recursos Naturales y Pesca. *Diario Oficial de la Federación. Norma Oficial Mexicana NOM-076-ECOL-1995*. (Mexico City, D.F.: 1995).

*Emission standards, background:* For passenger cars and light-duty trucks, the data in this table are from the *Mexican Official Standard NOM-042-ECOL-1993*, which sets forth the maximum allowable levels for nonburned hydrocarbons, carbon monoxide and nitrogen oxides emitted from the exhaust pipe of new motor vehicles at the assembly plant. This standard also sets the limit for evaporative hydrocarbons coming from fuel systems using gasoline, liquefied petroleum gas (LPG), natural gas and some other alternative fuels. This standard applies to vehicles with a gross vehicle weight of 400 kg to 3,857 kg. The standard was issued by the Instituto Nacional de Ecología (National Environmental Institute) in the *Diario Oficial de la Federación* (Federal Register) on October 22, 1993. The standard is available at [www.ine.gob.mx/dgra/normas/cont\\_at/vehiculos/no\\_42.htm](http://www.ine.gob.mx/dgra/normas/cont_at/vehiculos/no_42.htm).

*Heavy trucks:* For new diesel fueled heavy trucks (i.e., gross weight over 3,857 kilograms), NOM-044-ECOL-1993 sets the maximum allowable levels for the emission from the exhaust pipe of hydrocarbons, carbon monoxide, nitrogen oxides, total suspended particulates and opacity of the smoke. The standard was issued by the Instituto Nacional de Ecología (National Environmental Institute) in the *Diario Oficial de la Federación* (Federal Register) on October 22, 1993. The standard is available at [www.ine.gob.mx/dgra/normas/cont\\_at/vehiculos/no\\_44.htm](http://www.ine.gob.mx/dgra/normas/cont_at/vehiculos/no_44.htm).

For new spark-ignition heavy trucks (i.e., gross vehicle weight over 3,857 kg), NOM-076-ECOL-1995 sets the maximum allowable levels for the emission of nonburned hydrocarbons, carbon monoxide and nitrogen oxides coming from the exhaust pipe, as well as evaporative hydrocarbons coming from the fuel system. This standard applies to gasoline, LPG, natural gas and other alternative fuels. The standard was issued by the Secretaría del Medio Ambiente, Recursos Naturales y Pesca (Secretariat of Environment, Natural Resources and Fisheries) in the *Diario Oficial de la Federación* (Federal Register) on December 26, 1995. The standard is available at [www.ine.gob.mx/dgra/normas/cont\\_at/vehiculos/no\\_76.htm](http://www.ine.gob.mx/dgra/normas/cont_at/vehiculos/no_76.htm)

*Passenger cars and light-duty trucks:* Mexico does not regulate the emission of particulates for passenger cars and light duty trucks.

### United States

Table 4-6a and 4-6b are based on the following primary sources:

Passenger cars and light trucks: *U.S. Code of Federal Regulations*. (Washington, DC: 1998). 40 CFR86.094-8 and 40 CFR86.094-9.

U.S. Environmental Protection Agency. Office of Air and Radiation. *Mobile Source Emissions Standards Summary*. (Washington, DC: 1992).

U.S. Environmental Protection Agency. Office of Air and Radiation. Office of Mobile Sources, Vehicle Programs and Compliance Division. *Tier 2 Study White Paper*. (Washington, DC: 1997). Web site: [www.epa.gov/orcdizux/t2paper.htm](http://www.epa.gov/orcdizux/t2paper.htm)

Heavy trucks: U.S. Environmental Protection Agency. Office of Air and Radiation. *Emission Standards Reference Guide for Heavy-Duty and Nonroad Engines* (EPA420-F-97-014) September 1997. (Washington, DC: 1997).

U.S. Environmental Protection Agency. Office of Air and Radiation. *Mobile Source Emissions Standards Summary*. (Washington, DC: 1992).

Supplementary reference on mobile source emissions standards: <http://www.epa.gov/oms/stds-ld.htm> (A summary of Federal and California Light-Duty Exhaust Emission Standards)

*Emission standards, background:* Tightened emissions standards for new cars and light trucks (commonly referred to as the “Tier One Standards”) began to be phased in for model-year 1994, as called for in the 1990 Clean Air Act Amendments. (Phase-ins for some standards and some categories of light trucks began later. See the *U.S. Code of Federal Regulations* or the *National Transportation Statistics (NTS)-99*. The U.S. emission standards presented in Table 4-6a are a simplified version of the Tier One emission standards. The 1996 Canadian standards, according to their note on Table 4-6a, are the U.S. standards of 1988-1993 (Tier Zero standards).

The U.S. emission standards have a long and complex history, dating back over three decades. The current and historical standards are presented in detail in the *NTS-99*. The tables in the *U.S. Code of Federal Regulations*

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summarize the Tier 0 and Tier 1 standards, and cover not only gasoline and diesel-fueled cars and light trucks, but also methanol, natural gas and LPG-fueled vehicles. In addition, the Environmental Protection Agency's *Mobile Source Emissions Standards Summary* (full citation above) provides even more historical information, including detailed notes on exemptions and special provisions such as emissions averaging and high altitude standards. For emission standards for methanol, natural gas and LPG-fueled vehicles, see the *U.S. Code of Federal Regulations*. Detailed notes are not provided here on the emission standards and definitions for heavy trucks. For additional information on emissions standards of heavy trucks, see the references listed above and see web site: [www.epa.gov/omswww](http://www.epa.gov/omswww).

*Emission testing procedures:* Manufacturers test preproduction prototypes of new vehicle models in order to certify that the vehicles meet the federal emission standards. The manufacturers submit the test results to the Environmental Protection Agency, which confirms the accuracy of the figures they supply. The vehicles, which are fully assembled, are driven by a professional driver under controlled laboratory conditions, on a device similar to a treadmill. The test used to measure emissions simulates a 7.5-mile (12-kilometer), stop and go trip with an average speed of 20 miles per hour (32 kilometers per hour). The trip takes 23 minutes and has 18 stops. About 18 percent of the time is spent idling. Both cold engine starts and hot engine starts are included in the test. For more information on test protocols, go to [www.epa.gov/omswww](http://www.epa.gov/omswww).

*Implementation schedules:* For passenger cars, the Tier 1 standards were phased in at a rate of 40 percent for model-year 1994, 80 per-

cent for model year 1995 and 100 percent for model year 1996. The same schedule applies to LTD2, with the exception of particulates, which were phased in at a rate of 40 percent for 1995, 80 percent for 1996 and 100 percent for 1997. The rates apply to each motor vehicle manufacturer. For the implementation schedules for LDT1, LDT3 and LDT4, see *NTS-99* or the *U.S. Code of Federal Regulations*. (LDT refers to light duty trucks.)

*Useful life:* Useful life refers to the time or mileage over which the standards must be met. Motor vehicle manufacturers are required to produce cars and trucks that meet the standards for the specified years/miles. Consider the case of passenger cars: the vehicle must meet the first set of standards for 5 years or 50,000 miles, whichever comes first, and then the second set of standards for 10 years or 100,000 miles, whichever comes first. If there is no intermediate useful life standard (an example is the case of Nitrogen Oxide for diesel LDT2s (see below)), then the full useful life standard applies immediately. EPA checks that the vehicles are meeting the emissions standards for the intermediate and full useful lives through a program of recalls and testing. After the full useful life is met, federal emissions standards do not apply. However, as part of their inspection and maintenance procedures, the individual states may choose to require cars that have passed their full useful life (as defined by the federal emissions standards) to meet some kind of emissions standards. This would be part of a state's efforts to meet ambient air quality standards in local areas.

For the Tier 1 Standards (i.e., the U.S. standards in Table 4-6a), the useful lives are as follows:

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Passenger cars and LDT1 and LDT2 light trucks:

Intermediate useful life: 5 years/ 50,000 miles

Full useful life: 10 years/100,000 miles (10 years/161,000 kilometers)

(See *NTS-99* for the useful lives for the Tier 0 standards and for the Tier 1 standards for LDT3 and LDT4 trucks. For the useful lives of heavy trucks, see U.S. Environmental Protection Agency, Office of Air and Radiation, *Emission Standards Reference Guide for Heavy-Duty and Nonroad Engines* (EPA420-F-97-014) (September 1997) or the *NTS-99*.)

*Passenger cars and light trucks, data coverage and definitions:* Table 4-6a presents only the standards for *gasoline-fueled* passenger cars and light trucks. Moreover, the table presents standards *only for one of the four classes of light trucks*, LDT2. The standards for *diesel-fueled light vehicles* differ from those in Table 4-6a as follows:

*Passenger cars, nitrogen oxides:* The standards are 0.62 g/km for intermediate useful life (i.e., the Tier 0 standard remains in force) and 0.78 g/km for full useful life.

*Light trucks, nitrogen oxides, intermediate useful life:* No nitrogen oxide standard for LDT2. (However, the full useful life nitrogen oxide standard in Table 4-6a *does* apply to diesel-fueled LDT2s.)

*Cold-temperature carbon monoxide:* Standards do not apply to diesel-fueled passenger cars or light trucks. (The *Cold-Temperature Carbon Monoxide* standard is measured at 20 degrees Fahrenheit (minus 7 degrees Centigrade) rather than 75 degrees (24 de-

grees Centigrade), and is applicable for a 5-year/50,000 mile useful life. (50,000 miles = 80,500 kilometers.)

*Categories of light trucks:* Starting in 1994, there are four categories of light trucks, LDT1 through LDT4, with LDT1 the lightest. Because of the constraints of space in Table 4-6a, only the standards for LDT2 have been presented. In 1996, LDT2s accounted for more than 60 percent of the sales of new light trucks. (See the *NTS-99* or the EPA's *Tier 2 Study White Paper*, or the *U.S. Code of Federal Regulations* for the LDT1, LDT3 and LDT4 standards.) During 1988-1993, light duty trucks were divided into two subcategories, which correspond to the current LDT1 and the LDT2// LDT3//LDT4 categories.

LDT1 and LDT2 are defined in regulations as having a Gross Vehicle Weight Rating (GVWR) of up to 6,000 pounds (2,722 kilograms). (GVWR is the value specified by the manufacturer as the maximum design loaded weight of the vehicle.) The LDT1 and LDT2 categories differ in their Loaded Vehicle Weights (LVW). (LVW is the vehicle curb weight plus 300 pounds (136 kilograms)). LDT1 has a LVW of 0 to 3,750 pounds (0 to 1,701 kilograms) and LDT2 has a LVW of 3,751 to 5,750 pounds (1,701 to 2,608 kilograms). LDT3 and LDT4 are defined in regulations as having a GVWR of 6,001 pounds to 8,500 pounds (2,722 kg to 3,856 kg). LDT3 and LDT4 are divided according to their Adjusted Loaded Vehicle Weight. For more detail, see the *EPA Tier 2 Study White Paper*. Trucks weighing 8,501 pounds (3,856 kilograms) and more are defined as Heavy Duty Trucks.

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## SECTION 5: DOMESTIC FREIGHT ACTIVITY

### Tables 5-1 and 5-2 Domestic Freight Activity by Mode (Metric Tons)

### Domestic Freight Activity by Mode (Metric Ton-Kilometers)

#### Canada

Tables 5-1 and 5-2 are based on the following primary sources:

Air: Statistics Canada. *Canadian Civil Aviation, Catalogue 51-206-XPB*. (Ottawa, Ont.: various years).

Coastal shipping, Great Lakes and inland waterway and rail: Transport Canada. Economic Analysis Directorate based on Statistics Canada data. (Ottawa, Ont.: 1998).

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue 55-201-XPB*, and *Gas Utilities Transport and Distribution Systems, Catalogue 57-205-XPB*. (Ottawa, Ont.: various years).

Rail: Transport Canada. Economic Analysis Directorate based on Statistics Canada data. (Ottawa, Ont.: 1998)

Road: Statistics Canada. *Trucking in Canada, Catalogue 53-222-XPB*. (Ottawa, Ont.: various years).

Air: Air data reflect Level I to III Canadian air carriers that transported 1,000 or more metric tons of revenue goods, or 5,000 or more revenue passengers, between airports located within Canada. In Table 5-1, air data are in millions of metric tons. Actual tonnage is as follow: 1990: 386,749 metric tons; 1995: 416,171; and 1996: 447,313. In Table 5-2, data are in billions of metric ton-kilometers. Actual movements in thousands of

metric ton-kilometers are as follows: 1990: 532,396; 1995: 584,824; and 1996: 603,771.

Pipeline: Pipeline data include the amounts and metric ton-kilometers of oil and natural gas transported via domestic pipelines. These are calculated based upon determination of a percentage allocation between domestic and export deliveries. This split in volumes and distance is based on total volumes delivered, multiplied by the relative percentage of domestic deliveries. A conversion factor of 0.711 was used to convert cubic foot quantities of oil and natural gas moved by pipeline to metric ton equivalents.

Rail: Rail data are based on Class I and II rail loadings and unloadings. Class I includes Canadian National (CN) and Canadian Pacific (CPR) railways. Class II includes other railways involved in Canadian rail transportation operations. In Table 5-1 tonnage data exclude exports, imports and Class I carrier interline tonnage. In Table 5-2, the data for metric ton-kilometers similarly exclude exports, imports and Class I interline tonnage. (Freight interlined with Class II carriers was included while interline duplication between CN and CPR was removed).

Road: Road data are based on the *Quarterly For-Hire Trucking (Commodity Origin/Destination) Survey*. This survey measures outputs of the Canadian for-hire trucking industry by providing estimates of intercity commodity movements. Output variables include metric tons transported, commodities carried, revenues generated and origins and destinations of shipments. The target population consists of all shipments transported by Canadian domiciled for-hire motor carriers with annual transportation revenues derived from intercity trucking of \$1 million or more. Courier and messenger services are not covered by this survey.

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*Water transport:* All water data are based on domestic shipping information that is collected by means of the *S.1 Domestic Shipping Report* and the *S.4 Towboat and Ferry Operators Shipping Report* (the *S.4 report* is used on the West Coast only). A record of activity is filed with Statistics Canada for each vessel entering or leaving a Canadian port in domestic shipping, with the exception of cargo vessels under 15 net registered tons, tugs or other vessels under 15 gross registered tons, Canadian naval or fishing vessels, research vessels, ballast movements for towboats and ferry operators on the West Coast.

### Mexico

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras 1990-1996*. (Mexico City, D.F.: 1998).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Rail: Secretaría de Comunicaciones y Transportes. Based on data from Ferrocarriles Nacionales de México. *Series estadísticas 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1997).

*Air:* Data include shipments transported by domestic airlines under scheduled service and freight charters (shipments carried by air taxis are not included).

*Water transport:* Data include shipments made through the ports of the Pacific, the Gulf of Mexico and the Caribbean. In Table

5-2 an average distance of 630 kilometers for coastal sailing was assumed. Although this number is a 1988 estimate made by the former Dirección General de Obras Marítimas (Office of Maritime Works), the coastal sailing structure in Mexico has not changed much since then, so the figure remains a reasonable estimate.

Rail: Exports and imports are excluded from the rail data. Data represent the activity of all railroad systems. For Table 5-2 data were based on the average distances for the total system freight activity. For each year, the data were calculated using the following formula:

Ton-km transported in domestic traffic = (total ton-km transported/total ton transported) x ton transported in domestic traffic.

Road: Data are based on estimates of the number of freight vehicles registered to travel on the federal highway network in the *Sistema Integral de Información del Autotransporte Federal* (SIIAF) (Integral Information System of Federal Motor Carriers) of the Secretaría de Comunicaciones y Transportes, plus surveys that provide data on the actual average payload per vehicle per trip in tons and the number of trips per vehicle per week. Data for metric tons are calculated using the following formula:

Transported tons per year = Number of vehicles x average load per trip x average trips per vehicle per week x 52

These survey data are included in the document *Estadística Básica del Autotransporte Federal* (Basic Statistics of Federal Motor Carriers) prepared by Dirección General de Autotransporte Federal (Federal Motor Carrier General Directorate) of the Secretaría de Comunicaciones y Transportes.

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For table 5-2, the estimate of metric tons is multiplied by the average distance that freight vehicles travel. The average distance is derived from a survey conducted by the Dirección General de Autotransporte Federal of the Secretaría de Comunicaciones y Transportes, and takes into consideration origin/destination information.

### **United States**

Table 5-1 is based on the following primary sources:

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: various years). Page 2.

Coastal shipping, Great Lakes and inland waterways: U.S. Army Corps of Engineers. *Waterborne Commerce of the U.S., Part 5*. (New Orleans, LA: Annual issues). Section 1, Table 1-4.

Pipeline, crude oil and petroleum products: Association of Oil Pipe Lines. *Shifts in Petroleum Transportation*. (Washington, DC: various years). Table 1.

Pipeline, natural gas: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation based on Department of Energy data. (Washington, DC: 1999).

Rail: Association of American Railroads. *Railroad Facts, 1997*. (Washington, DC: 1997). Page 27.

Road: Eno Transportation Foundation, Inc. *Transportation in America, 1997*. (Lansdowne, VA: 1997). Page 44.

Table 5-2 is based on the following primary sources:

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: various years). Page 2.

Coastal shipping, Great Lakes and inland waterways: U.S. Army Corps of Engineers. *Waterborne Commerce of the U.S., Part 5*. (New Orleans, LA: Annual issues). Section 1, Table 1-4.

Pipeline: Association of Oil Pipe Lines. *Shifts in Petroleum Transportation*. (Washington, DC: various years). Table 1.

Rail: Association of American Railroads. *Railroad Facts, 1997*. (Washington, DC: 1997). Page 27.

Road: Eno Transportation Foundation, Inc. *Transportation in America, 1997*. (Lansdowne, VA: 1997). Page 44.

Air: Air data are measured in enplaned revenue-tons and revenue ton-kilometers. These data include cargo, mail and express shipments. They include cargo being carried by the large certified domestic air carriers and some cargo airlines. Data for cargo carried by express carriers such as FedEx, DHL and UPS may be underrepresented. Air tonnage and ton-kilometers data represent the scheduled and nonscheduled activity of all large certified carriers. The large certificated air carriers operate aircraft with seating capacity of more than sixty seats or a maximum payload capacity of more than 8,165 kilograms (18,000 pounds.) (See technical notes under Table 4-2 for a more complete definition of the large certificated air carriers.) Data for commuter and foreign air carriers are not included. Data exclude military cargo moved by civilian carriers. Ton-kilometer data in Table 5-2 include U.S. and foreign mail and courier (express) services.

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*Water transport (coastal shipping, Great Lakes, and inland waterways):* All water data are based on domestic waterborne traffic movements that are reported to the U.S. Army Corps of Engineers (USACE) by all vessel operators of record. Beginning in 1996, data on fishing are excluded for internal waterways traffic. Domestic ton-kilometers equal the cargo tonnage multiplied by the distance between the point of loading on the water and the point of unloading on the water. Specifically, for U.S.-Canada movements on the Great Lakes, ton-kilometers equal the tonnage multiplied by the distance between the U.S. and Canadian locations.

Great Lakes data include waterborne traffic between the United States ports on the Great Lakes system. The Great Lakes system is treated as a separate waterway system rather than as a part of the inland waterway system. Coastal shipping data include domestic traffic over the ocean, or the Gulf of Mexico (e.g., New Orleans to Baltimore, New York to Puerto Rico, San Francisco to Hawaii, or Alaska to Hawaii). Traffic between Great Lakes ports and seacoast ports, when having a carriage over the ocean, also is included in Coastal Shipping data. Inland waterways data represent the sum of the USACE categories of internal and intraport waterways. For USACE definitions of internal and intraport waterways, see the annual USACE publication, *Waterborne Commerce of the U.S. Part 5*.

*Pipeline:* Pipeline data in Table 5-1 are for domestic crude oil, petroleum products and natural gas shipments. Natural gas data in Table 5-1 are a BTS estimate based on Department of Energy data. Natural gas is typically measured in volumes using cubic feet, but has been converted to metric tons for purpose of this table. BTS converted the stan-

dard natural gas unit of measurement from cubic feet to metric tons, using a conversion factor of 1 metric ton to approximately 36,775 cubic feet. This conversion factor is based on assumptions about the relative composition of natural gas: proportions of methane, ethane, propane and other hydrocarbons.

Pipeline data for ton-kilometers in Table 5-2 include crude oil, petroleum products and natural gas shipments. Ton-miles for natural gas are estimates based on an approximate mile per ton rate for crude oil transported by pipelines. The crude petroleum and petroleum products data in both tables represent information from the Association of Oil Pipe Lines based on *Annual Report (Form 6)* data that oil pipeline companies submit to the Federal Energy Regulatory Commission. Note that the pipeline data for Table 5-2 will not correspond to pipeline data for ton-kilometers (ton-miles) in the annual BTS publication, *National Transportation Statistics*. This is because the *NTS* data for pipeline ton-miles only include crude oil and petroleum products.

*Rail:* Rail data are measured in revenue ton-kilometers and tons originated and is for Class I railroads only. In 1996 (Class I railroads had annual gross operating revenues in approximate excess of \$256 million and comprise only 2 percent of the railroads in the U.S., but account for 71 percent of the industry's distance operated, 89 percent of its employees and 91 percent of its freight revenues. Rail data reflect shipments that originated in the United States. The final destination of these shipments may or may not have been within the continental United States. The source of tonnage data in Table 5-1 are the freight commodity statistics re-

ports that Class I carriers are required by law to annually report to the Surface Transportation Board. The source of ton-kilometers in Table 5-2 are annual reports (R-1) that individual Class I carriers must also file with the Surface Transportation Board. The Association of American Railroads (AAR) then aggregates and releases a total figure for ton-kilometers by all Class I carriers on an annual basis.

*Road:* Road data represent an estimate of *intercity* trucking traffic *only*. The Eno Transportation Foundation (Eno) estimates truck tonnage based on truck tonnage trends reported by the American Trucking Association (ATA) and by truck vehicle-kilometers trends reported by the Federal Highway Administration at the U.S. Department of Transportation. Eno estimates truck ton-kilometers based on both actual changes in truck ton-kilometers as reported by the former Interstate Commerce Commission (ICC) and as based on changes in vehicle-kilometers of combination and large single-unit trucks on U.S. nonurban highways as reported annually by FHWA. To estimate truck ton-kilometers, Eno multiples vehicle-kilometers by an estimated average load figure.

**Table 5-3a**  
**Top Canadian Domestic Freight**  
**Commodities by Mode: 1996**

**Canada**

Table 5-3a is based on the following primary sources:

Pipeline, crude oil and petroleum products: Statistics Canada. *Oil Pipeline Transport, Catalogue 55-201-XPB, 1996.* (Ottawa, Ont.: 1997).

Pipeline, natural gas: Statistics Canada. *Gas Utilities, Transport and Distribution Systems,*

*Catalogue 57-205-XPB, 1996.* (Ottawa, Ont.: 1997).

Rail: Statistics Canada. *Rail in Canada, Catalogue 52-216-XPB, 1996.* (Ottawa, Ont.:1998).

Road: Statistics Canada. Transportation Division. Special "For-Hire" Trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada's Marine Database.)

Pipeline data include amounts of oil, natural gas and petroleum products transported via domestic pipelines and is calculated based upon determination of a percentage allocation between domestic and export deliveries. This split in volumes is based on total volumes delivered, multiplied by the relative percentage of domestic deliveries. A conversion factor of .711 was used to convert cubic foot quantities of oil and natural gas products moved by pipeline to metric ton equivalents. Rail data in this table are based on Canadian Class I and II carriers.

**Table 5-3b**  
**Top Mexican Domestic Freight**  
**Commodities by Mode: 1996**

**Mexico**

Rail: Secretaría de Comunicaciones y Transportes based on data from the Ferrocarriles Nacionales de México. *Series Estadísticas, 1996.* (Mexico City, D.F.: 1997).

Road: Instituto Mexicano del Transporte based on the vehicle's weight and dimensions study. (Sanfandila, Qro.: 1997).

Water: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

*Rail and water transport*: The principal transported goods are listed as individual products, not as major groupings of products. Data come from railroad bills of lading and maritime cargo manifests.

*Road*: Groups of similar products are listed. The numbers are derived from a sample using field measurements and surveys on the federal highways for the year 1993. For 24 hours during 3 consecutive days, survey and weighing stations were set up at strategic locations on the federal highway network, which covers the main routes of the country. The numbers include, but do not identify, commodities traded internationally. The data are included here because they represent the main commodities transported by road within the country.

**Table 5-3c**  
**Top U.S. Domestic Freight**  
**Commodities by Mode: 1993**

**United States**

Air, road and rail: U.S. Department of Commerce. U.S. Census Bureau. *1993 Commodity Flow Survey*. Special tabulation. (Washington, DC: 1998).

Pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation. (Washington, DC: 1998).

Water: U.S. Army Corps of Engineers (USACE). *Waterborne Commerce of the United States, Calendar Year 1996; Part 5—National Summaries*. (New Orleans, LA: 1997).

*Air, rail, road and intermodal data*: Data for these modes are from the 1993 Commodity

Flow Survey (CFS) and are based on the Standard Transportation Commodity Classification (STCC) code. The CFS collects information on the commodities shipped by domestic U.S. manufacturing, mining, wholesale trade and selected retail and service industries. The survey excludes shipments by most service industries, governments, households and establishments classified as farms and construction. The CFS includes exports but not imports. Air data in table 5-3c represent shipments by both air and truck/air combination. Rail data represent rail single mode shipments. Road data represent shipments moved by private truck and for-hire truck. Intermodal data represent shipments moved by intermodal truck and rail combination.

*Pipeline*: Crude oil and petroleum products data are estimates from the Oak Ridge National Laboratory (ORNL), based on information from the Federal Energy Regulatory Commission. Natural gas data are BTS estimates based on information on natural gas delivered to consumers from the U.S. Department of Energy's *Natural Gas Annual*. BTS converted the standard natural gas unit of measurement from cubic feet to metric tons, using a conversion factor of 1 metric ton to approximately 36,775 cubic feet. This conversion factor is based on assumptions about the relative composition of natural gas: proportions of methane, ethane, propane and other hydrocarbons. In 1993, pipelines transported about 18.5 trillion cubic feet.

*Water transport*: Water data are from the U.S. Army Corps of Engineers' (USACE) publication, *Waterborne Commerce of United States* and are based on USACE waterborne commodity codes.

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**Table 5-4a**  
**Top Canadian Domestic Freight**  
**Interprovincial Pairs by Mode: 1996**

**Canada**

Table 5-4a is based on the following primary sources:

Rail: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Rail data adapted by Transport Canada from Statistics Canada Sources.)

Road: Statistics Canada. Transportation Division. Special “For-Hire” Trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada’s Marine Database.)

Rail data in this table are based on Canadian Class I and Class II carriers. Class I includes Canadian National (CN) and Canadian Pacific (CPR) railways. Class II includes other railways involved in Canadian rail transportation operations.

**Table 5-4b**  
**Top U.S. Domestic Freight Interstate**  
**Pairs by Mode: 1993**

**United States**

U.S. Department of Commerce. U.S. Census Bureau. *1993 Commodity Flow Survey*. Special tabulation. (Washington, DC: 1998). CD-CFS-93-2.

All modal data presented in this table are from the 1993 *Commodity Flow Survey (CFS)*, which collects information on the commodities shipped by domestic U.S. manufacturing, mining, wholesale trade and selected retail

and service industries. The survey excludes shipments by most service industries, governments, households and establishments classified as farms and construction. The CFS includes exports but not imports.

Air data represent shipments by both air and truck/air combination. Pipeline data are non-existent because the CFS data do not fully represent crude petroleum shipments by pipelines and there is no origin and destination information for pipeline shipments. Rail data represent rail single mode shipments. Road data represent shipments moved by private truck and for-hire truck. Water data include freight movements on inland, Great Lakes and deep-sea waterways. Intermodal data represent shipments moved by intermodal truck and rail combination.

**Table 5-5a**  
**Top Canadian Domestic Freight Area**  
**Pairs by Mode: 1996**

**Canada**

Table 5-5a is based on the following primary sources:

Road: Statistics Canada. Transportation Division. Special “For-Hire” Trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada’s Marine Database.)

For road and water transport data, see technical notes for Tables 5-1 and 5-2.

**Table 5-5b**  
**Top Mexican Domestic Freight Area**  
**Pairs by Mode: 1996**

**Mexico**

Air: Instituto Mexicano del Transporte based on special tabulation of the Secretaría de Comunicaciones y Transportes. (Sanfandila, Qro: 1999). Dirección General de Aeronáutica Civil.

Rail: Instituto Mexicano del Transporte. *Evaluación Económica de Mejoras a la Infraestructura del Sistema Nacional Ferroviario, Publicación Técnica No. 82*. Estimates included in this document based on information from the Ferrocarriles Nacionales de México. (Sanfandila, Qro.: 1996).

Road: Instituto Mexicano del Transporte. Special tabulation from *Estudio de pesos y dimensiones de los vehículos de carga que circulan en la red nacional de carreteras, 1994*. (Sanfandila, Qro.: 1999.)

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

Rail: The original data source document is the *Informe de Tráfico de Flete Comercial por Artículos Clasificados por Estaciones Remitentes y Receptoras (Report on Commercial Fleet Traffic per Classified Items sent to Receiving Stations)*, previously collected by the Ferrocarriles Nacionales de México. Data include all rail movements within Mexico, and may include some cargo with foreign destinations. Data shown are major interurban movements. The two highest rail freight pairs were excluded, because they owe their ranking to the transportation of raw materials for the production process of particular firms: (1) the transportation of 2,237,000 tons

of limestone between Huehuetoca and Tlalnepantla, both in the State of Mexico; and (2) 1,784,000 tons of coal between Nueva Rosita and Monclova, Coahuila.

Road: Figures come from field surveys on the federal highways for the year 1993. For 24 hours during 3 consecutive days, survey and weighing stations were set up at strategic locations on the federal highway network, which cover the main routes of the country. Figures include, but do not identify, commodities traded abroad. The data are included here because they represent the main origin/destination pairs for road transportation of goods within the country.

**SECTION 6: NORTH AMERICAN**  
**MERCHANDISE TRADE**

**Table 6-1a**  
**Canadian Merchandise Trade With**  
**Mexico and the United States by Mode**  
**of Transportation**

(Current U.S. dollars)

**Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

*Merchandise trade, data collection and sources*: The primary objective of the Canadian International Merchandise Trade Statistical Program is to measure the change in the stock of material resources of the country resulting from the movement of merchandise into or out of Canada. When goods are imported into or exported from Canada, declarations must be filed with Canadian Customs giving such information as description and value of the goods, origin and port of clearance of commodities and the mode of transport. In 1990, Canada entered into a Memorandum of Understanding (MOU) with the United States

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concerning the exchange of import data. As a consequence, each country is using the other's import data to replace its own export data. Canada's international merchandise trade statistics are, therefore, no longer derived exclusively from the administrative records of Revenue Canada, Customs and Excise, but from U.S. Customs records as well.

*Merchandise trade, definitions:* Canadian merchandise trade statistics are compiled according to the "General" system of trade defined by the United Nations Statistical Office. Under this system, imports include all goods that have crossed Canada's territorial boundary, whether for immediate consumption in Canada or stored in bonded Custom warehouses. Domestic exports include goods grown, extracted or manufactured in Canada, including goods of foreign origin that have been materially transformed in Canada, including foreign goods withdrawn for export from bonded customs warehouses. Total exports are the sum of domestic exports and reexports. Thus the general trade system, in principal, presents all goods entering through the country (imports) and all goods leaving the country (exports).

*Valuation of imports:* For Customs purposes, imports are recorded at values established according to the provisions of Canada's *Customs Act*, which, since January 1985, reflect valuation methods based on the General Agreement on Tariffs and Trade (GATT) Valuation Code System. It generally requires the value for duty of imported goods be equivalent to the transaction value or the price actually paid. To determine the transaction value of imported goods, all transportation and associated costs arising prior to and at the place of direct shipment to Canada are to be added to the price of the goods. Therefore, Canadian imports are valued f.o.b. (free

on board), place of direct shipment to Canada. This valuation excludes the freight and insurance costs in bringing the goods into Canada from the point of direct shipment.

*Valuation of exports:* To countries other than the United States, exports are, in principal, valued or recorded at the values declared on export documents, which usually reflect the transaction value; i.e., the actual selling price, or for specific transactions, the transfer price used for company accounting purposes. Canadian exports to overseas countries are valued at f.o.b. (free on board), port of exit, including domestic freight charges to the port of exit, but net of discounts and allowances. As of January 1990, Canadian exports to the United States are valued f.o.b., point of exit from Canada.

*Method of transportation:* For exports, the mode of transport information represents the mode of transport by which the international boundary is crossed. For Canadian exports via the United States to Mexico, the mode reported would be the mode used to cross the Canadian/U.S. border. If, for example, Canadian export shipments destined for Mexico travel by truck through Fort Erie, Ontario, then the mode reported in this table, and in Canadian international trade data, will be truck.

For imports, the mode of transport information represents the last mode of transport by which the cargo was transported to the port of clearance in Canada and is derived from the cargo control documents of Canadian Customs. This may not be the mode of transport by which the cargo arrived at the Canadian port of entry in the case of inland clearance. If, for example, Canadian import shipments from Mexico crossed the Canadian/U.S. border by rail, but are not cleared by Canadian Customs until they reach an-

other city by truck, the mode reported, in Canada's international trade statistics, will be truck.

In this and similar tables and for both import and export shipments, the category of *pipeline and other* are, for the most part, pipeline movements. *Other* represents mail and parcel post and other miscellaneous modes of transport.

**Table 6-1b**  
**Mexican Merchandise Trade With Canada and the United States by Mode of Transportation**

(Current U.S. dollars)

**Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

*Total trade:* Total export and import figures are final. Figures on exports and imports by mode of transportation are preliminary. Totals differ from the sum of the modes because data for "Postal and other" modes were not included in the modal subcategories, but were included in the overall totals.

*Maquiladora trade:* The Maquiladora industry accounted for 39.1 percent and 38.5 percent of the total value of exports for 1995 and 1996, respectively, and 35.2 percent and 33.2 percent of imports for those 2 years.

**Table 6-1c**

**U.S. Merchandise Trade With Canada and Mexico by Mode of Transportation**

(Current U.S. dollars)

**United States**

*Total trade:* U.S. Department of Commerce. Census Bureau. *Statistical Abstract of the United States*. (Washington, DC: 1990, 1995 and 1996).

*Air and water:* U.S. Department of Commerce. Census Bureau. Foreign Trade Division. *FT920 Report, U.S. Merchandise Trade: Selected Highlights* (Washington, DC: December 1990, 1995 and 1996).

*Road, rail and pipeline:* U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

For a detailed documentation on U.S. international trade data, see the U.S. Census Bureau's *Guide to Foreign Trade Statistics* (available at <http://www.census.gov/foreign-trade/www/ftd.stat.guide.html>).

*Merchandise trade, data collection and sources:* Data on the value of U.S. air, maritime and land imports and exports are captured from administrative documents required by the Departments of Commerce and Treasury. In 1990, the United States entered into a Memorandum of Understanding (MOU) with Canada concerning the exchange of import data. As a consequence, each country is using the other's import data to replace its own export data. The United States' international merchandise trade statistics are, therefore, no longer derived exclusively from the administrative records of the Departments of Commerce and Treasury, but from Revenue Canada, Customs and Excise as well. Historically, merchandise trade data were obtained from import and export paper documents that

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the U.S. Customs Service collected at a port of entry or exit. However, an increasing amount of import and export statistical information is now being captured electronically. Approximately 98 percent of U.S. import and 60 percent of U.S. export data are collected electronically.

*Merchandise trade, definitions:* Data represent merchandise trade activity between the United States, Puerto Rico and the U.S. Virgin Islands and Canada and Mexico. These statistics do not include traffic between Guam, Wake Island and America Samoa and Canada and Mexico.

*Valuation of imports and exports:* Import values represent the value of merchandise for duty (or Customs) purposes. It is usually the selling price in the foreign country of origin, and excludes freight costs, insurance and other charges incurred in bringing the merchandise from the foreign port of export to the United States. For exports to all countries except Canada, export values represent the value of the merchandise, usually the selling price, plus insurance, inland freight costs and other charges incurred in bringing the merchandise to the U. S. port of export. This is generally called the f.a.s. (free alongside ship) value. These export values *exclude* the cost of loading the merchandise aboard the exporting carrier at the port of export and also exclude freight, insurance, and any charges or transportation costs beyond the U.S. port of exportation. Because the United States does not collect information for U.S. exports to Canada from its own trade documents, the value of these exports represents the transaction value of the merchandise, plus a Statistics Canada *imputed* estimate of the costs of insurance, inland freight and other charges. Statistics Canada estimate is based on 4.5 percent of the export merchandise transaction value.

*Method of Transportation:* Method of transportation is based on the method of transportation in use when the merchandise arrived at the U.S. Customs port of entry or departed a U.S. Customs port of exit. In some instances, shipments between the United States and countries abroad enter or depart the United States through Canada or Mexico. These are called transshipments. Such transshipments are recorded under the method of transportation by which they enter or depart a U.S. Customs port regardless of the transportation mode used between Canada or Mexico and the final country of origin or destination. For U.S. exports via Canada to other overseas countries, the mode reported would be the mode used to cross the U.S./Canadian border. If, for example, export shipments that are destined for the United Kingdom travel by truck through Buffalo/Niagara, NY, and are then shipped by water from a Canadian port to the United Kingdom, the mode reported in U.S. international trade data would be truck.

For the time period April 1993 through December 1996, transshipments were included in official U.S. trade data for land modes of transportation, and it is impossible to exclude these transshipments *at an individual modal level*. Because the land modes include transshipment data, the sum of the modal categories exceeds total U.S. trade with Canada and Mexico for 1995 and 1996. Moreover, it is not possible to calculate modal percentage shares for 1995 and 1996. Beginning in January 1997, transshipments are no longer included in the U.S. trade figures for land modes of transportation. Thus, the modal shares for 1997 can be calculated. The 1997 modal shares for total U.S. merchandise trade with Canada and Mexico are: air (5.8 percent); water (4.6 percent); road (68.0 percent); rail (14.7 percent); pipeline (3 percent); and other (3.9 percent).

## U.S. Trade With Canada and Mexico by Land Modes of Transportation\*

(Millions of current U.S. dollars)

|                                   | 1995, total<br>with<br>transshipments | 1995, total<br>without<br>transshipments | 1996, total<br>with<br>transshipments | 1996, total<br>without<br>transshipments |
|-----------------------------------|---------------------------------------|--|---------------------------------------|--|
| <b>U.S. trade<br/>with Canada</b> |                                       |  |                                       |  |
| Exports to<br>Canada              | 129,884.1                             | 108,311.1                                | 139,109.7                             | 117,341.8                                |
| Imports from<br>Canada            | 143,669.5                             | 135,212.2                                | 156,206.6                             | 146,374.3                                |
| <b>U.S. trade<br/>with Mexico</b> |                                       |  |                                       |  |
| Exports to<br>Mexico              | 42,662.2                              | 42,294.5                                 | 51,753.4                              | 51,252.7                                 |
| Imports from<br>Mexico            | 54,048.9                              | 51,489.7                                 | 63,312.2                              | 62,188.1                                 |

\*Land modes of transportation include truck, rail, pipeline, government mail, flyaway aircraft (aircraft moving from the aircraft manufacturer to a customer and not carrying any freight), powerhouse electricity, pedestrians carrying freight, foreign trade zones (for imports only) miscellaneous and unknown.

**Source:** U.S. Department of Transportation, Bureau of Transportation Statistics. *Transborder Surface Freight Data* ([www.bts.gov/transborder](http://www.bts.gov/transborder))

In contrast to transshipments, *intransit shipments* are goods declared by the shipper as moving through the United States from one foreign country to another and are *not* included in the official U.S. international merchandise trade statistics, and therefore are not included in this data for this table. In a North American context, intransit shipments would include, for example, a Canadian export to Mexico, which moves by truck through the United States. This type of activity, again, is not considered to be part of U.S. international trade, and is not reflected in official U.S. merchandise trade statistics, or in the data in this table.

The following modes are included in U.S. merchandise trade statistics: air, maritime vessel, truck, rail, pipeline, government mail, flyaway aircraft (aircraft moving from the aircraft manufacturer to a customer and not carrying any freight), powerhouse electricity, pedestrians carrying freight, foreign trade zones (for imports only) miscellaneous and unknown. Data for land modes (i.e., truck, rail, pipeline, mail and other) of transportation are nonexistent prior to April 1993. Government mail, flyaway aircraft, powerhouse electricity, pedestrians carrying freight, foreign trade zones, miscellaneous and unknown methods of transportation have not

been included as specific categories for U.S. merchandise trade in Sections 6 and 7 of this publication. However, these modes of transportation are included in the overall U.S. merchandise trade figures.

**Table 6-2a**  
**Canadian Merchandise Trade With Mexico and the United States by Mode of Transportation**

(Metric tons)

**Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

*Merchandise trade, weight data:* The International Trade Division (ITD) of Statistics Canada publishes monthly trade statistics for both exports and imports. The data are drawn from Revenue Canada (Customs) administrative files that are used for applying import/export and tariff regulations. A variety of trade characteristics are reported monthly for each commodity, with the main ones being country, commodity, mode of transport and value. The capture and reporting of weight information by commodity is generally given less priority than value and country data. Weight and quantity information currently reported by ITD depend, for the most part, on what commodity is being reported. For instance, most bulk commodities e.g., wheat, coal, potash, are reported in metric tons. Commodities of a more finished nature tend to be reported in various units of quantity or weight, generally using one of the international units of measure published in the Statistics Canada report, *Imports by Commodity* (65-007-XPB).

*Merchandise trade, weight data collection:* With the current system used by Revenue Canada

Customs to report international trade data; i.e., using the *B3* reporting form (for imports) and the *B13* reporting form (for exports to overseas countries), there is no requirement for custom brokers to report in one consistent unit of weight measurement. Except for exports to the United States, Canadian exporters and importers are not required to report a shipping weight for each commodity shipped. The requirement is to report an overall gross and net weight for each record, which may include one or multiple commodities on any one form. Value and mode of transport are always captured for each commodity and quantity is frequently captured. Trade data by mode of transport are published in value terms only.

*Weight conversion methodology and factors:* Canada and the United States capture and exchange import trade data as part of a bilateral data exchange agreement. On a monthly basis, Canada sends to the United States data on its imports from the United States and, in turn, receives from the United States data covering imports from Canada. As both countries record imports using different trade documents, with different requirements, the data elements collected are not consistent in all areas. For instance, the United States collects weight data for each import commodity by all modes of transportation for merchandise trade with all countries. If relevant to the commodity type, the United States also collects quantity information on all merchandise imports. However, the weight and quantity information captured by Revenue Canada depends on the type of commodity.

A variety of validation and edit checks are performed on the U.S. imports from Canada, before the data are sent back to Canada as part of the U.S.-Canada data exchange. From

this edited file, relationships can be derived between quantities, value and shipping weight for each commodity. Statistics Canada has used these relationships in the development of a weight conversion methodology and factors. Use of the Harmonized System (HS) for commodity classification has been an important component in the development of these conversions. At the six-digit HS level, exports and imports are essentially the same, and likely possess similar weight characteristics. Statistics Canada conversion methodology involves the development of factors for converting the value or quantity of international trade commodities to metric tons for six-digit HS codes. Trade commodities reported in nonmetric units for imports from all countries (including the U.S.) as well as exports to all countries (excluding the U.S.) are converted using one of the following conversion factors: quantity to shipping weight (quantity conversion factor); or value to shipping weight (value conversion factor). If quantity information is available, the quantity conversion factor is used. If not, the value conversion factor is used. Because exports to the United States already provided shipping weight information and served as the source of Statistics Canada's conversion factors, they are accepted as is.

*Method of transportation:* For exports, the mode of transport information represents the mode of transport by which the international boundary is crossed. For Canadian exports via the United States to Mexico, the mode reported would be the mode used to cross the Canadian/U.S. border. If, for example, Canadian export shipments destined for Mexico travel by truck through Fort Erie, Ontario, then the mode reported in this table, and in Canadian international trade data, will be truck.

For imports, the mode of transport information represents the last mode of transport by which the cargo was transported to the port of clearance in Canada and is derived from the cargo control documents of Canadian Customs. This may not be the mode of transport by which the cargo arrived at the Canadian port of entry in the case of inland clearance. If, for example, Canadian import shipments from Mexico crossed the Canadian/U.S. border by rail, but are not cleared by Canadian Customs until they reach another city by truck, the mode reported, in Canada's international trade statistics, will be truck.

In this and similar tables and for both import and export shipments, the category of *pipeline and other* are, for the most part, pipeline movements. *Other* represents mail and parcel post and other miscellaneous modes of transport.

**Table 6-2b**  
**Mexican Merchandise Trade With**  
**Canada and the United States by Mode**  
**of Transportation**

(Metric tons)

**Mexico**

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. Special tabulation. (Mexico City, D.F.: 1997).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1998).

Road and rail, 1996: Instituto Mexicano del Transporte. Special tabulations based on data from the Secretaría de Comercio y

Fomento Industrial and U.S. Bureau of Transportation Statistics. (Querétaro, Qro.: 1998). See also Juan Manuel Trejo. *Una metodología para valorar los beneficios económicos de mejoras en los sistemas de transporte (A Methodology to Evaluate the Economic Benefits of Improving the Transportation Systems)*, M.S. Thesis, Querétaro Autonomous University, Qro.

*Road and rail, 1996:* The Instituto Mexicano del Transporte (IMT) estimated the figures based on data provided by the Secretaría de Comercio y Fomento Industrial in Mexico and the Bureau of Transportation Statistics in the United States. For 1995, the IMT estimates that 4,023 million tons were exported from Mexico to the north, and 11,005 million tons were imported into Mexico from the north. The United States was the origin and destination of the vast majority of these shipments, although some shipments originated in, or were destined for, Canada. There is no way of quantifying the specific proportion allocated to Canada versus the United States.

For 1996, 5,482 million tons were exported from Mexico to the north by rail. Of this, 4,813 million tons were shipped to the United States. The remaining 669 million tons were either shipped to Canada or (although originating in Mexico as rail shipments) were ultimately transshipped via air or sea through U.S. or Canadian ports. Also in 1996, 12,933 million tons were imported into Mexico from the north by rail. Of this, 10,307 million tons came from the United States. The remaining 2,626 million tons came either from Canada or from a third country, but reached Mexico as a transshipment from Canadian or U.S. ports.

## Table 6-2c

### U.S. Merchandise Trade With Canada and Mexico by Mode of Transportation

(Metric tons)

#### United States

Total trade: U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States*. (Washington, DC: 1990, 1995 and 1996).

Air and water: U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *FT920 U.S. Merchandise Trade*. (Washington, DC: December 1990, 1995 and 1996).

Road, rail and pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

*Shipping weight:* Shipping weight represents the gross weight in kilograms of shipments, including the weight of commodities and packaging (such as wrappings, crates, boxes and containers). For air, maritime vessel and imports by land modes of transportation, shipping weight information is a required data element on the merchandise trade documents of the Departments of Commerce and Treasury. Currently, data on the shipping weight of exports by land modes of transportation (truck, rail, pipeline, mail and other) are not required to be collected if the exporter or broker files a paper trade documentation, known as the *Shipper's Export Declaration*. (At present, approximately 30-40 percent of U.S. export data are collected via paper trade documents). Under new automated filing procedures through the Automated Export System (AES), shipping weight for exports will be required. In addition, because shipping weight for imports from Mexico by land modes of transportation only

became available in April 1995, calendar year 1995 data are not available for inclusion in Table 6-2c. For additional explanation, see notes for Table 6-1c.

*Method of transportation:* Method of transportation is based on the method of transportation in use when the merchandise arrived at the U.S. Customs port of entry or departed a U.S. Customs port of exit. In some instances, shipments between the United States and countries abroad enter or depart the United States through Canada or Mexico. These are called transshipments. Such transshipments are recorded under the method of transportation by which they enter or depart a U.S. Customs port regardless of the transportation mode used between Canada or Mexico and the final country of origin or destination. For U.S. exports via Canada to other overseas countries, the mode reported would be the mode used to cross the U.S./Canadian border. If, for example, export shipments that are destined for the United Kingdom travel by truck through Buffalo/Niagara, NY, and are then shipped by water from a Canadian port to the United Kingdom, the mode reported in U.S. international trade data would be truck.

For the time period April 1993 through December 1996, transshipments were included in official U.S. trade data for land modes of transportation, and it is impossible to exclude these transshipments, measured in weight, at either a total land trade or individual modal level. Because of this inclusion of transshipment data for the land modes of transportation, a summation of the individual modal categories will exceed the U.S. total trade with Canada and Mexico for 1995 and 1996. Beginning in January 1997, transshipments are no longer included in the U.S. trade figures for land modes of transportation.

In contrast to transshipments, *intransit shipments* are goods declared by the shipper as moving through the United States from one foreign country to another and are *not* included in the official United States international merchandise trade statistics, and therefore are not included in this data for this table. In a North American context, intransit shipments would include, for example, a Canadian export to Mexico, which moves by truck through the United States. This type of activity, again, is not considered to be part of U.S. international trade, and is not reflected in official U.S. merchandise trade statistics, or in the data in this table.

**Table 6-3a**  
**Top Canadian Gateways for North American Merchandise Trade by Mode: 1996**

(Current U.S. dollars)

**Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998). See notes for Table 6-1a.

**Table 6-3b**  
**Top Mexican Gateways for North American Merchandise Trade by Mode: 1996**

(Current U.S. dollars)

**Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

This table shows the information by mode registered at the principal custom ports (or custom “houses”) in Mexico. Land transportation includes shipments by both road and rail. In addition, data from inland customs ports (and those not considered “principal”) are added to the overall figures for the principal customs ports shown in Table 6-3b.

**Table 6-3c**  
**Top U.S. Gateways for North American Merchandise Trade by Mode: 1996**

(Current U.S. dollars)

**United States**

Air: U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. Transportation Branch. Special tabulation. (Washington, DC: 1998).

Water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. *Annual Waterborne Databanks 1996* (formerly TA 305/705). (Washington, DC: 1998).

Road, rail and pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

For additional explanation, see notes for Table 6-1c.

Air data for specific airports may include a low (generally less than 2-3 percent of the total value) level of small user-fee airports located in the same regional area. In addition, data for nearby individual courier operations are included in the certain airport totals to prevent disclosure. Land port totals include transshipment data. Port totals reflect the mode of transportation in use at the time the shipment entered or exited a U.S. Customs port.

**Table 6-4a**  
**Top Mexican Maritime Intransit Shipment Ports: January-June 1997**

**Mexico**

Instituto Mexicano del Transporte. Special tabulation based on 1997 data from the Journal of Commerce. *Port Import Export Reporting Service (PIERS)*. (Querétaro, Qro.: 1998).

**Table 6-4b**  
**Top U.S. Maritime Intransit Shipment Ports: 1996**

**United States**

U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. *Annual Waterborne Databanks 1996* (formerly TA 305/705). (Washington, DC: 1998).

Intransit shipments are goods declared by the shipper as moving through the United States from one foreign country to another and are *not* included in the official U.S. international merchandise trade statistics or in the United States balance of trade of goods and services. Although U.S. international merchandise trade statistics cover all methods of transportation, the intransit statistics cover only goods, which enter or leave the United States by maritime vessel. Goods may arrive by vessel and depart by air, land or vessel, or arrive by land or air and depart by maritime vessel. Therefore, inbound and outbound intransit statistics may not cover the same intransit movements and these movements of goods do not present a full picture of the intransit trade. (For example, an intransit shipment that entered the United States by truck and exited by rail would not be included in these statistics at all.) In addition, the value data for intransit statistics

are estimated based on the type of commodity and its' shipping weight. Intransit data tend to be dutiable commodities since the United States Customs Service requires that shipments transiting through the United States be handled under a Customs bond (in-bond).

### **Table 6-5a**

#### **Top Land Freight Crossing Ports, Canadian-U.S. Border: 1996**

##### **North and southbound:**

Data for trucks represent the number of truck crossings, not the number of unique vehicles. (For example, one truck may cross back and forth across the border several times in a day.)

Northbound (Canadian data source): Statistics Canada. Culture, Tourism and the Center for Education Statistics Division. Special tabulations. (Ottawa, Ont.: 1998).

Table 6-5a is based on data collected through Statistics Canada's Frontier Count program. All ports of entry across Canada participate in determining the number of cars, trucks, motorcycles and bicycles in the case of highway and ferry points as well as the number of travelers by selected categories and by type of transportation. These surveys are conducted on a census basis except for seven ports of entry that are using sampling schemes to estimate automobiles and motorcycle flows. The sample is intended to estimate U.S. and Canadian vehicles and travelers by country of residence. The samples are selected among the seven ports in order to represent all days of the month over the region. Customs officials at these ports provide the count of automobiles and cycle traffic by country of residence for those sample days. These counts are then weighted to the total flows provided by toll authorities.

Southbound (U.S. data source): U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).

Data reflect all trucks and trains that entered the United States, across the U.S.-Canadian border, regardless of carrier nationality.

### **Table 6-5b**

#### **Top Land Freight Crossing Ports, Mexican-U.S. Border: 1996**

##### **North and southbound:**

Data for trucks represent the number of truck crossings, not the number of unique vehicles. (For example, one truck may cross back and forth across the border several times in a day.)

Northbound (U.S. Data Source): U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).

Data reflect all trucks and rail cars that entered the United States, across the U.S.-Mexican border, regardless of carrier nationality.

Southbound:

Trucks: Data compiled by Texas A&M International University, Texas Center for Border Economic and Enterprise Development based on original data from bridge operators. Web site: [www.tamui.edu/coba/txcntr/](http://www.tamui.edu/coba/txcntr/)

Rail: Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte 1996*. (Querétaro, Qro.: 1998).

**Table 6-6a**  
**Top Canadian Merchandise Trade**  
**Commodities by Mode With Mexico:**  
**1996**

**Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 6-1a.

**Table 6-6b**  
**Top Canadian Merchandise Trade**  
**Commodities by Mode With the United**  
**States: 1996**

**Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 6-1a.

**Table 6-7a**  
**Top Mexican Merchandise Trade**  
**Commodities by Mode With Canada:**  
**1996**

**Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**Table 6-7b**  
**Top Mexican Merchandise Trade**  
**Commodities by Mode With the United**  
**States: 1996**

**Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística.

Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**Table 6-8a**  
**Top U.S. Merchandise Trade**  
**Commodities by Mode With Canada:**  
**1996**

**United States**

Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1996*. (Washington, DC: 1998).

Road and rail: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

See notes for Table 6-1c.

**Table 6-8b**  
**Top U.S. Merchandise Trade**  
**Commodities by Mode With Mexico:**  
**1996**

**United States**

Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1996*. (Washington, DC: 1998).

Road and rail: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

See notes for Table 6-1c.

## **SECTION 7: INTERNATIONAL MERCHANDISE TRADE BETWEEN NORTH AMERICA AND THE REST OF THE WORLD**

In all the tables in this section, intra-North American trade is excluded (e.g., Canada's trade with Mexico and the United States is excluded; Mexico's trade with Canada and the United States is excluded; and the United State's trade with Mexico and Canada is excluded). For the series of weight based commodity tables (7-5), data were not available for Mexico that excluded trade with Canada and the United States. A table for Mexico has been included in the technical notes section for the table series 7-5, which provides data for Mexico's top international trade commodities by weight for *all* of its international trade. This table is included between the Canadian and U.S. technical notes for Tables 7-5a and 7-5b.

### **Table 7-1 International Merchandise Trade Between North America and the Rest of the World by Value**

#### **Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 6-1a and 7-1.

#### **Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

Data refer to exports to and imports from outside North America: i.e., Canada and the United States are excluded. Figures are preliminary and approximate, and stem from a study made by Instituto Nacional de Estadística, Geografía e Informática, based on foreign trade data tapes provided by the Secretaría de Hacienda y Crédito Público. Other modes of transportation include mail and miscellaneous modes.

#### **United States**

Air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996*. (Washington, DC: 1998).

See also notes for Tables 6-1c.

*Method of transportation*: Method of transportation is based on the method of transportation in use when the merchandise arrived at the U.S. Customs port of entry or departed a U.S. Customs port of exit. Data in Table 7-1 exclude U.S. trade with Canada and Mexico. For Table 7-1, data are only available for air and water modes of transportation, and the total trade represents a sum of these two modes.

In some instances, shipments between the United States and countries abroad enter or depart the United States through Canada or Mexico. These are called transshipments. Such transshipments are recorded under the method of transportation by which they enter or depart a U.S. Customs port regardless of the transportation mode used between Canada or Mexico and the final country of origin or destination. For U.S. exports via Canada to other overseas countries, the mode reported would be the mode used to cross the U.S./Canadian border. If, for example, export shipments that are destined for the United Kingdom travel by truck through Buffalo/Niagara, NY, and are then shipped by water from a Canadian port to the United Kingdom, the mode reported in U.S. international trade data would be truck.

For the time period April 1993 through December 1996, transshipments were included in official U.S. trade data with Canada and Mexico for land modes of transportation, and it is impossible to exclude these transshipments at an individual modal level. Therefore, data are nonexistent for land modes of transportation (road, rail, pipeline and other) for Table 7-1. Beginning in January 1997, transshipment totals by truck and rail, became available for the value of U.S. transshipments through Canada and Mexico. Data for these are included in the monthly detailed data files of the Bureau of Transportation Statistics' *Transborder Surface Freight Data* ([www.bts.gov/transborder](http://www.bts.gov/transborder))

**Table 7-2**  
**International Merchandise Trade**  
**Between North America and the Rest**  
**of the World by Weight**

**Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

See also notes for Tables 6-1a and 6-2a.

*Method of transportation, imports:* For imports, the mode of transport information represents the last mode of transport by which the cargo was transported to the port of clearance in Canada and is derived from the cargo control documents of Canadian Customs. This may not be the mode of transport by which the cargo arrived at the Canadian port of entry, if the cargo are cleared by Canadian Customs at an inland port. If, for example, commodities imported from the United Kingdom arrived by ship in Toronto, Ont., but are not cleared in Canada until they reach another city by truck, the mode reported in Canadian international trade statistics will be truck.

*Method of transportation, exports:* Exports by land modes of transportation in this table represent Canadian trade with a second country that were transshipped via a third country, generally the United States. For exports, the mode of transport information represents the mode of transport by which the international boundary is crossed. For Canadian exports via the United States to other overseas countries, the mode reported would be the mode used to cross the Canadian/U.S. border. If, for example, export shipments that are destined for the United Kingdom travel by truck through Fort Erie, Ontario, and are then shipped by water from a U.S. port to the United Kingdom, the mode reported in Canadian international trade data in this table will be truck.

## Mexico

The following table provides data for Mexico's overall international trade by mode, measured in millions of metric tons. Data in this table *include* trade with Canada and the United States.

### Mexico's International Merchandise Trade by Weight

(Millions of metric tons)

|                           | Mexico |       |       |
|---------------------------|--------|-------|-------|
|                           | 1990   | 1995  | 1996  |
| <b>Total trade</b>        | U      | U     | U     |
| Exports                   | U      | U     | U     |
| Imports                   | U      | U     | U     |
| <b>Air trade, total</b>   | 0.1    | 0.2   | U     |
| Exports                   | U      | U     | U     |
| Imports                   | U      | U     | U     |
| <b>Water trade, total</b> | 107.9  | 123.0 | 145.1 |
| Exports                   | 88.9   | 103.3 | 117.6 |
| Imports                   | 19.0   | 19.7  | 27.5  |
| <b>Road trade, total</b>  | 17.7   | 33.5  | U     |
| Exports                   | 7.7    | 14.4  | U     |
| Imports                   | 10.0   | 19.1  | U     |
| <b>Rail trade, total</b>  | 16.2   | 21.7  | 28.6  |
| Exports                   | 4.4    | 7.0   | 9.1   |
| Imports                   | 11.8   | 14.7  | 19.5  |

U = Data are unavailable.

**Air:** Cargo carried by domestic and foreign companies under scheduled international service. Freight charters are excluded.

**Water:** Data comprise cargo shipments through the ports of the Pacific, the Gulf of Mexico and the Caribbean.

**Road:** Data refer to international shipments that were shipped via the Mexican federal highway system. Data for 1995 were unavailable. Data in the table represent 1994.

**Rail:** Cargo imported and exported without making any distinction whether bound to the United States or Canada.

#### Sources

**Air:** Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras, 1989-1995*. (Mexico City, D.F.: 1996).

**Water:** Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

**Road:** Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte, 1997*. (Querétaro, Qro.: 1998).

**Rail:** Ferrocarriles Nacionales de México. *Series estadísticas 1990,1995 and 1996*. (Mexico City, D.F.: various years).

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## United States

Air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996*. (Washington, DC: 1998).

See also notes for Tables 6-1c and 6-2c.

*Method of transportation:* Method of transportation is based on the method of transportation in use when the merchandise arrived at the U.S. Customs port of entry or departed a U.S. Customs port of exit. Data in Table 7-2 exclude U.S. trade with Canada and Mexico. For Table 7-2, data are only available for air and water modes of transportation, and the total trade represents a sum of these two modes.

In some instances, shipments between the United States and countries abroad enter or depart the United States through Canada or Mexico. These are called transshipments. Such transshipments are recorded under the method of transportation by which they enter or depart a U.S. Customs port regardless of the transportation mode used between Canada or Mexico and the final country of origin or destination. For U.S. exports via Canada to other overseas countries, the mode reported would be the mode used to cross the U.S./Canadian border. If, for example, export shipments that are destined for the United Kingdom travel by truck through Buffalo/Niagara, NY, and are then shipped by water from a Canadian port to the United Kingdom, the mode reported in U.S. international trade data would be truck.

For the time period April 1993 through December 1996, transshipments were included in official U.S. trade data with Canada and Mexico for land modes of transportation, and it is impossible to exclude these transshipments at an individual modal level. Therefore, data are nonexistent for land modes of transportation (road, rail, pipeline and other) for Table 7-2.

### **Table 7-3a** **Top Canadian International** **Merchandise Trade Gateways by Mode:** **1996 (Excluding Trade With Mexico and** **the United States)**

(Current U.S. dollars)

#### **Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 6-1a and 7-1.

### **Table 7-3b** **Top U.S. International Merchandise** **Trade Gateways by Mode: 1996** **(Excluding Trade With Canada and** **Mexico)**

(Current U.S. dollars)

#### **United States**

Air: U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. Transportation Branch. Special tabulation. (Washington, DC: 1998).

Water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. *Annual Waterborne Databanks 1996* (formerly TA 305/705). (Washington, DC: 1998).

For additional explanation, see notes for Table 6-1c and 7-1.

Air data for specific airports may include a low (generally less than 2-3 percent of the total value) level of small user-fee airports located in the same regional area. In addition, data for nearby individual courier operations are included in the certain airport totals to prevent disclosure. Port totals reflect the mode of transportation (air or water) in use at the time the shipment entered or exited a U.S. Customs port.

**Table 7-4a**  
**Top Canadian International Trade Commodities by Value: 1996 (Excluding Trade With Mexico and the United States)**

(Current U.S. dollars)

**Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 6-1a and 7-1.

**Table 7-4b**  
**Top Mexican International Trade Commodities by Value: 1996 (Excluding Trade With the United States and Canada)**

(Current U.S. dollars)

**Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**Table 7-4c**  
**Top U.S. International Trade Commodities by Value: 1996 (Excluding Trade With Canada and Mexico)**

(Current U.S. dollars)

**United States**

Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based upon U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996.* (Washington, DC: 1998).

See notes for Table 6-1c and 7-1.

**Table 7-5a**  
**Top Canadian International Trade Commodities by Weight: 1996 (Excluding Trade With Mexico and the United States)**

**Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Tables 6-1a, 6-2a and 7-2.

**Top Mexican International Trade Commodities by Weight: 1996**

**Mexico**

International trade data excluding trade with Canada and the United States are not available with commodity detail. The table below shows *all* international merchandise trade for Mexico by weight. The headings of each column indicate the year. (Data are *not* based on the two-digit Harmonized Schedule (HS) but on the common name of the product.)

**Top Mexican International Trade  
Commodities by Weight, Various Years**  
(Thousands of metric tons)

| OVERALL                                   | 1993           |
|---|----------------|
| <b>Exports</b>                            | <b>108,079</b> |
| Crude oil                                 | 69,117         |
| Regular salt                              | 6,200          |
| Fuel oil                                  | 3,117          |
| Gypsum                                    | 2,869          |
| Bar or ingot iron                         | 1,379          |
| <b>Imports</b>                            | <b>50,144</b>  |
| Fuel oil                                  | 4,364          |
| Sorghum                                   | 3,745          |
| Soybean seed                              | 2,171          |
| Wheat                                     | 1,741          |
| Cellulose pulp for<br>paper manufacturing | 1,510          |
| AIR                                       |                |
| <b>Air exports</b>                        |                |
| U   | U              |
| <b>Air imports</b>                        |                |
| U   | U              |
| LAND (rail only)                          | 1995           |
| <b>Land exports (rail only)</b>           | <b>5,482</b>   |
| Assembled motor vehicles                  | 1,348          |
| Cement                                    | 1,078          |
| Beer                                      | 548            |
| Disassembled motor vehicles               | 130            |
| Iron and steel sheets and plates          | 389            |
| <b>Land imports (rail only)</b>           | <b>12,933</b>  |
| Soybeans                                  | 1,406          |
| Maize                                     | 1,257          |
| Paper and cardboard waste                 | 917            |
| Wheat                                     | 601            |
| Sorghum                                   | 582            |
| WATER                                     | 1996           |
| <b>Water exports</b>                      | <b>117,598</b> |
| Oil and by-products                       | 82,662         |
| Regular salt                              | 7,270          |
| Limestone                                 | 5,978          |
| Gypsum                                    | 3,587          |
| Cement                                    | 1,874          |
| <b>Water imports</b>                      | <b>27,533</b>  |
| Oil and by-products                       | 4,857          |
| Limenite                                  | 3,797          |
| Sorghum                                   | 1,311          |
| Wheat                                     | 1,104          |
| Phosphoric rock and fertilizer            | 967            |

**Sources**

Overall: Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte, 1996*. (Sanfandila, Qro.: 1998). Based on the *Sumario Estadístico de la Revista Comercio Exterior*, April 1993 and March 1994, Banco Nacional de Comercio Exterior.

Land (rail only): Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte, 1996*. (Sanfandila, Qro.: 1998). Based on information from Ferrocarriles Nacionales de México.

Water: Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte, 1996*. (Sanfandila, Qro.: 1998). Based on information from the Secretaría de Comunicaciones y Transportes, Dirección General de Puertos y Marina Mercante; i.e., based on information from the Secretaria de Comunicaciones y Transportes, Dirección General.

**Table 7-5b  
Top U.S. International Trade  
Commodities by Weight: 1996  
(Excluding Trade With Canada and  
Mexico)**

**United States**

Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based upon U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996*. (Washington, DC: 1998).

See notes for Table 6-1c, 6-2c and 7-2.

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## SECTION 8: DOMESTIC PASSENGER TRAVEL

Data do not include passenger travel by commercial freight vehicles.

**Table 8-1**  
**Domestic Passenger Travel by Mode**

### Canada

Table 8-1 is based on the following primary sources:

Air: Statistics Canada. *Canadian Civil Aviation, Catalogue 51-206-XPB*. (Ottawa, Ont.: various years).

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

Rail: Statistics Canada. *Rail in Canada, Catalogue 52-216-XPB*. (Ottawa, Ont.: various years).

*Passenger-kilometers, total*: The total is approximate because it is dominated by an estimated number for road, and because data for general aviation do not exist. (Transit also is estimated, and placed under Local Motor Bus, under Road.)

Air: Air data reflect Canadian Level I through Level III air carriers that, in each of the 2 calendar years immediately preceding the report year, transported 5,000 or more revenue passengers, or 1,000 or more metric tons of revenue goods, between airports located within Canada. Data for general aviation/noncommercial passenger travel do not exist because this type of information is not collected. As a result, a total for domestic passengers transported by the air mode of transport in Canada is also nonexistent.

Road: Road passenger-kilometer data are based on a Transport Canada estimate for 1995 of the number of vehicle-kilometers traveled by personal motor vehicles (includes passenger cars, motorcycles and light trucks) and buses. Estimates of vehicle-kilometers are calculated based on: (1) road motor vehicle fuel sales (net sales on which taxes were paid at road-use rates); and (2) estimates of fuel efficiency by class of vehicle. Estimates of average occupancy are then applied to the estimates of vehicle-kilometers to arrive at passenger kilometers. Buses include inter-city, charter, school and local transit buses.

Rail: Rail data include Class I (VIA Rail) and Class II (other carriers involved in Canadian rail passenger transportation operations) Canadian railways.

### Mexico

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

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1997).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Water: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante (Mexico City, D.F.: 1998)

For all data included in Table 8-1, the distances used to estimate indicators; i.e., passenger-kilometers, were based on routes and traffic intensities.

Air: Data include only domestic airlines with scheduled service. General aviation activity is not included.

*Bus, total and intercity:* Data for all types of buses are nonexistent, because these data are not collected. In Table 8-1 only data for intercity buses are reported. These buses use Mexico's federal highway system, and do not include local transit buses. Intercity bus data for passenger-kilometers are estimates based on the size of the vehicle fleet and the following formula:

Passengers—kilometers = passengers transported x distance traveled.

Passengers transported = vehicle fleet x used capacity x trips per week x weeks per year

The vehicle fleet is the number of vehicles that move passengers on the federal road system. Used capacity is the average number of used seats per vehicle. Trips per week is the average number of trips per vehicle per week. Weeks per year is the average number of weeks an intercity bus is in service during the year. Distance traveled is the distance between the origin and destination of the bus.

### United States

Table 8-1 is based on the following primary sources:

#### Air:

Air carrier: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: 1986-1997). Page 2, Line 1.

General aviation: U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation 1996*, available at [www.bts.gov](http://www.bts.gov).

#### Road:

1990, 1995: U.S. Department of Transportation. Federal Highway Administration. *High-*

*way Statistics, Summary to 1995*. (Washington, DC: 1996). Table VM-201A.

1996: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Table VM-1.

Local motor bus: American Public Transit Association (APTA). *Transit Fact book*. (Washington, DC: various years).

Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996), statistical appendix.

Transit rail: American Public Transit Association. *Transit Fact Book*. (Washington, DC: various years).

*Air:* Air data comprise air carrier and general aviation passenger-kilometers. Air carrier data in the United States are based on 100 percent reporting of passengers and trip length by the large certificated air carriers (including the medium regional carriers). There are some 90 air carriers that operate aircraft with a passenger seating capacity of more than 60, or have a payload capacity of more than 8,165 kilograms, or operate internationally. (See the technical notes under Table 4-2 for more information on large certificated air carriers.) The figures do not include data for all airlines; most notably, small certificated air carriers, scheduled commuter airlines and on-demand air taxis are excluded. If added, these might raise the totals by roughly 5 percent. Air carrier passenger-kilometers are computed by summing the aircraft kilometers flown on each inter-airport segment multiplied by the number of passengers carried on that segment. Passenger-kilometers for general aviation (which in this table includes on-demand air taxi) are calculated by increasing earlier figures by the percentage change in annual hours flown by general aviation aircraft, as published in the

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Federal Aviation Administration's *Statistical Handbook of Aviation*.

**Road:** Road data are based on statistics compiled by the Federal Highway Administration (FHWA) at the U.S. Department of Transportation from data reported by each state. Road passenger-kilometers are calculated by multiplying the vehicle kilometers of travel by the average number of occupants for each vehicle type (as estimated by FHWA, using various sources, especially, the Nationwide Personal Transportation Survey). The quality of the data varies by the level of the functional road system and by each state's effort and adherence to FHWA methods. FHWA edits reports that are unreasonable because of obvious errors or large changes. In July 1997, FHWA published revised passenger-kilometers data for the road mode for several years. The major change reflected the reassignment of some vehicles from the passenger car category to the FHWA category "other 2-axle, 4-tire vehicles" (called "light truck" in this table). Light trucks include vans, pickup trucks, minivans and sport utility vehicles. Passenger cars include taxis. Bus totals are based on data from the FHWA and include charter, intercity, local motor bus and school bus. Local motor bus is based on data from a private association, and is described under transit. Road data *do not* include passenger travel by commercial freight vehicles.

**Transit:** Transit data are from the American Public Transit Association (APTA) and are based on information in the Federal Transit Administration's (FTA) National Transit Database. APTA conservatively adjusts the FTA data to include transit operators that do not report to this database. These nonreporting operators typically include private, very small and/or rural operators. There are about 6,000 transit operators in the U.S., according to APTA; about 1,000 of these report to FTA. However, these 1,000 operators ac-

count for approximately 90 to 95 percent of the total transit passenger-kilometers. Reliability of the U.S. transit data varies by mode. The numbers for rail are the most comprehensive; those for bus are less so because there are so many more operators. Transit passenger-kilometers are the cumulative sum of the distances ridden by each passenger. Transit total includes other U.S. transit categories not individually specified here, including local motor bus, trolley bus, ferries and transit for the disabled. Transit rail includes commuter rail, heavy rail and light rail. Local motor bus included here is not included in the total to avoid double counting with the estimate of bus passenger vehicle-kilometers in the road data.

**Intercity rail:** Intercity rail data are based on an almost 100 percent count of tickets from the service provider in the United States (Amtrak) and, therefore, are considered to be very accurate.

**Table 8-2a**  
**Top Canadian Domestic Passenger**  
**Metropolitan Area Pairs by Mode: 1996**

**Canada**

**Air:** Statistics Canada. *Air Passenger Origin and Destination, Domestic Report—1996, Catalogue 51-204-XPB*. (Ottawa, Ont.: 1997).

**All other modes:** Statistics Canada. *Micro Data Files relating to the Canadian Travel Survey (CTS)—1996, Catalogue 87M006XCB*. (Ottawa, Ont.: 1998).

**Air:** Air data in this table are based on scheduled domestic air passenger journeys by air carriers, as collected by the *Passenger Origin Destination Survey*. Air carrier figures refer to total outbound and inbound domestic passenger journeys in 1996. Statistics Canada's Aviation Statistics Centre developed

the *Passenger Origin-Destination Survey* to collect air passenger statistics. The *Air Passenger Origin and Destination Report, Catalogue 52-204-XPB*, is published annually to provide estimates, by directional origin and destination, of the number of passengers traveling on scheduled domestic commercial flights. These passenger counts are reported by major (Level I and certain Level II) air carriers to the *Passenger Origin-Destination Survey*. Approximately 85 percent of the total commercial air passengers in Canada are serviced by air carriers that participate in the *Passenger Origin-Destination Survey*. Data for general aviation/noncommercial passenger travel do not exist because this type of information is not collected. As a result, top metropolitan area pairs for domestic passengers transported by all air modes of transport in Canada is also nonexistent.

The data in Table 8-2a are based on passengers flown by Level I and Level II Canadian air carriers. To qualify as a Level I carrier, the carrier must have transported at least 1,000,000 revenue passengers or at least 200,000 metric tons of revenue goods in each of the 2 calendar years immediately preceding the report year. (Level I carriers are divided into Level IA and Level IB, with IA the larger.) Level II carriers must have transported at least 50,000 revenue passengers or at least 10,000 metric tons of revenue goods in each of the 2 calendar years immediately preceding the report year.

*Intercity rail/road/water:* Data in this table for Intercity Rail, Road, and Water are based on “person-trips,” as collected by Statistics Canada for its *Canadian Travel Survey (CTS)*. These figures refer to total outbound and inbound domestic passenger trips in 1996. For purposes of the *CTS*, a “trip” is defined as travel by the respondent accompanied or

not by one or more household members for any reason (except as noted below) to a Canadian destination of at least 80 kilometers one-way from home. The following types of travel are excluded: travel to and from work or school (i.e., commuting); one-way travel involving a change of residence; travel of operating crew members of buses, airplanes, boats, etc; travel in an ambulance to a hospital or clinic; trips that did not originate in Canada; trips longer than a year.

The *Canadian Travel Survey* is a biennial survey whose purpose is to gather information on domestic trips and travelers to measure the volume, characteristics and economic impact of domestic travel by Canadians. The *CTS* is a supplement using the *Labour Force Survey (LFS)* sampling frame and collects more than 30 characteristics, including socio-demographic information on travelers, trips and expenditures. In 1996, a monthly sample of approximately 16,000 persons was interviewed. That same year, additional information was also collected. For the first time, the *CTS* measured the number of visits and provided allocated expenditures at the national, provincial and subprovincial level. The results of the *Canadian Travel Survey* are published in *Touriscope-Domestic Travel* (Catalogue 87-504), which is prepared by the Tourism Statistics Program of Statistics Canada.

**Table 8-2b**  
**Top Mexican Domestic Passenger**  
**Metropolitan Area Pairs by Mode: 1996**

**Mexico**

*Air:* Instituto Mexicano del Transporte based on data from Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Querétaro, Qro.: 1998).

*Intercity rail and bus:* Data for 1996 are for passenger travel by interurban railroad and by bus are presented below for the principal

terminals. The objective is to provide an idea of the geographical distribution of passenger flows within Mexico by bus and rail.

### **Intercity Passenger Rail, 1996**

(Thousands of passengers utilizing specific terminals)

| Name of passenger rail terminal | Thousands of passengers utilizing specific terminals, 1996 |
|---------------------------------|--|
| Mexico City, D.F.               | 728  |
| Veracruz, Ver.                  | 181  |
| Guadalajara, Jal.               | 171  |
| Monterrey, N.L.                 | 160  |
| Chihuahua, Chih.                | 141  |

Instituto Mexicano del Transporte based on data from Ferrocarriles Nacionales de México (Querétaro, Qro. 1998)

### **Intercity Passenger Bus, 1996**

(Thousands of passengers utilizing specific terminals)

| Name of passenger bus terminal         | Thousands of passengers utilizing specific terminals, 1996 |
|--|--|
| Mexico City, D.F.                      |  |
| Mexico City, D.F. (Terminal del Norte) | 22,851   |
| Mexico City, D.F. (Terminal Oriente)   | 17,164   |
| Guadalajara, Jal.                      | 16,501   |
| Celaya, Gto.                           | 13,799   |
| Monterrey, N.L.                        | 12,576   |
| Acapulco, Gro.                         | 10,087   |

Secretaría de Comunicaciones y Transportes. Dirección General de Autoransporte Federal. *Estadísticas Básicas del Autotransporte Federal, 1996.* (Mexico City, D.F. 1997)

Water: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1998).

*Air and water:* Air carrier is an Instituto Mexicano del Transporte estimate based on data provided from Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. Water data represent port pairs.

**Table 8-2c**  
**Top U.S. Domestic Passenger Metropolitan Area Pairs by Mode: 1995**

**United States**

U.S. Department of Transportation. Bureau of Transportation Statistics. *1995 American Travel Survey*. Special tabulation. (Washington, DC: 1996).

Conducted in 1995, the Bureau of Transportation Statistics' American Travel Survey (ATS) collected data on trips of 100 miles or more one-way made by U.S. residents. Flows between places less than 100 miles apart are not included in the data set. Flows are based on person trips between metropolitan areas. For more information on the ATS, see the web site: [www.bts.gov/ats](http://www.bts.gov/ats)

**SECTION 9: NORTH AMERICAN PASSENGER TRAVEL**

Canada and Mexico both collect data on same day and overnight international travel from travel surveys and other sources. However, the data sources for each country may differ in definitions and methodologies. Both Canada's and Mexico's data are based on country of residency. Residents of a country are those people that are entitled to live permanently in that country. For the purposes of the

travel data included in this section, resident travel would include travel by both citizens of the particular country, as well as, residents of that country.

The United States does not collect data on same day and overnight travel to and from the United States for all modes of transportation, and with the same level of travel characteristics that Canada and Mexico do. The International Trade Administration's *Survey of International Air Travelers* captures travel characteristics data for U.S. residents traveling abroad and for international visitors to the United States. However, the survey only captures travel by air. The Bureau of Transportation Statistics' *American Travel Survey* captures data on international travel of U.S. residents by all modes of transportation. However, the distance basis of the ATS (trips of 100 miles or more) limits its utility in the North American context, since the majority of U.S.-Canada and U.S.-Mexico travel is same day travel with trips of less than 100 miles. Because of these and other data gaps, the United States agreed to use Canadian data to represent U.S.-Canada travel and Mexican data to represent U.S.-Mexican data.

**Table 9-1a**  
**Canada-Mexico/Mexico-Canada Travel by Mode of Transportation**

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope), Catalogue 66-201-XPB*. (Ottawa, Ont.: various years).

*Data sources:* The Tourism Statistical Program at Statistics Canada collects, analyzes and disseminates data on tourism. Tourism is broadly defined as the business, pleasure and leisure activities that support a person

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travelling abroad. The existing method of collecting international travel statistics is described under the two Statistics Canada headings of "Frontier Counts" and "Questionnaire Surveys." Both these systems depend greatly on the cooperation of Revenue Canada, Customs and Excise in the collection of the number of crossings and the distribution of travel questionnaires. Except for Tables 9-2a and 10-1, all data in Sections 9 and 10 are based on a combination of frontier count and questionnaire sampling. Data for all tables in Section 9 are based on travel from Canada by Canadian residents and on travel to Canada by U.S. or Mexican residents.

*Frontier count data:* All ports of entry across Canada participate in determining the number of travelers by selected categories, by type of transportation, as well as the number of cars, trucks, motorcycles and bicycles in the case of highway and ferry points. These surveys are conducted on a census basis except for seven ports of entry that are using sampling schemes to estimate automobiles and motorcycle flows. The sample is intended to estimate U. S. and Canadian vehicles and travelers by country of residence. The samples are selected among the seven ports in order to represent all days of the month over the region. Custom officials at these ports provide the count of automobiles and cycle traffic by country of residence for those sample days. These counts are then weighted to the total flows provided by toll authorities.

*Questionnaire surveys:* Questionnaire surveys are used to secure information on the expenditures and other characteristics of an international traveler. According to prearranged schedules, Canadian Customs distributes the questionnaires to the travel party upon entry for nonresidents or upon reentry for Canadian residents. As part of a continuing at-

tempt to improve travel surveys at minimal cost, a sampling scheme is used at all major land and air border points where a questionnaire is distributed to eligible travelers over a period of several days. Each port involved in the sampling scheme receives, for a specified period, a specific quantity of numbered questionnaires and a date on which to start the distribution. For estimation purposes, the responses obtained through the questionnaire surveys are treated as a simple random sample from the total traffic in each stratum (port or group of ports, by type of traffic, by quarter). The data may in fact be subjected to some degree of "distribution bias," due to the fact that not all categories of travelers are represented, or to a "nonresponse bias" due to the fact that the individuals replying may not be representative of the population.

Data from questionnaire surveys are captured and disseminated on the basis of person-trips. (Each time a nonresident traveler enters Canada marks the beginning of a person-trip. Canada Customs records each traveler's entry. A person-trip concludes when the traveler leaves Canada. For residents, each time a person departs from Canada, a person-trip begins. The person-trip ends when the traveler returns to Canada.) However, for the purposes of comparability with Mexican and U.S. data, data in Sections 9 and 10 is reported on the basis of visitors, unless otherwise noted.

### **Mexico**

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

*Data sources:* The Banco de México is the responsible agency for collecting the majority of international travel data in Mexico. Most of these data are collected through survey

instruments. Overall, the goals of the Banco de México tourism survey program are to collect tourism data as part of the calculation of the balance of payments and to collect other information in order to analyze the behavior of tourists. To support these goals, data on expenditures for local transportation, lodging, food, amusement, personal care items, souvenirs, medical care and other purchases are gathered. In addition, data such as length of stay, income level, purpose of trip, means of transportation, point of departure and major cities visited also are gathered. Through a sample survey, data are collected at specific international airports and border cities. Data are collected from travelers in automobiles, buses, trains, as well as travelers boarding and deboarding aircraft. Each individual traveler is surveyed when leaving the country.

For the purposes of its own survey program, the Banco de México uses specific definitions to categorize types of visitors. However, due to the need for use of common terminology in Sections 9 and 10, some standard categories were used for the data tables. The category "Mexican Resident Overnight Travel to Canada" includes Mexican resident travelers who traveled from Mexico to Canada where they stayed for at least 24 hours. The category "Canadian Resident Overnight Travel to Mexico" includes Canadian resident travelers who traveled from Canada to Mexico where they stayed for at least 24 hours.

**Table 9-1b**  
**Canada-United States/United States-Canada Travel by Mode of Transportation**

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries*

(*Touriscope*), *Catalogue 66-201-XPB*. (Ottawa, Ont.: various years).

See technical notes for Table 9-1a.

**United States**

For purposes of this publication, the United States and Canada have agreed to use Canadian source data for this table. However, the American Travel Survey (ATS) is another source that provides data for trips made by U.S. residents to Canada of more than 100 miles one-way in 1995. The ATS definition of a visitor, therefore, results in a much lower estimate of travel than reflected in the table, particularly for same-day travel. For overnight travel the ATS estimates 9,867,000 U.S. visitors to Canada in 1995, 76 percent of the travel estimated in the table. The ATS estimates a higher proportion of air travel (35 percent versus 21 percent) because, on the whole, it counts longer distance trips than in the table, trips that are more likely to be taken by airplane. The estimates of bus travel are very similar in percentage terms, with the ATS estimating 5 percent of trips versus 6 percent in the table. The ATS estimates 96 percent of bus trips were taken by charter or tour bus, 3 percent by intercity bus and 1 percent by school bus. The ATS estimates less than 1 percent of overnight trips to Canada were taken by intercity rail. For more information on the ATS, see web site: [www.bts.gov/ats](http://www.bts.gov/ats)

**Table 9-1c**  
**Mexico-United States/United States-Mexico Travel by Mode of Transportation**  
**Mexico**

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

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See technical note on Table 9-1a for additional information on data sources.

The category "Mexican Resident Same Day Travel to the U.S." includes Mexican resident travelers who traveled from Mexico to the United States and who stayed within the border region (the border region extends 25 miles (40 kilometers) from the U.S./Mexican border). The category "U.S. Resident Same Day Travel to Mexico" includes U.S. resident travelers who traveled from the United States to Mexico and who stayed within the border region. The category "Mexican Resident Overnight Travel to the U.S." includes Mexican resident travelers who traveled from Mexico to the United States and who stayed in the United States for at least 24 hours. This includes Mexican residents who stayed within the border region, as well as those who traveled further inland into the United States for a minimum period of 24 hours. The category "U.S. Resident Overnight Travel to Mexico" includes U.S. resident travelers who traveled from the United States to Mexico and who stayed in Mexico for at least 24 hours. This includes U.S. residents who stayed within the border region, as well as those who traveled further inland into Mexico for a minimum period of 24 hours.

### **United States**

For purposes of this publication, the United States and Mexico have agreed to use Mexican source data for this table. The American Travel Survey (ATS) provides data for trips made by American residents to Mexico of more than 100 miles one-way in 1995. The ATS definition of a visitor, therefore, results in a much lower estimate of travel than reflected in the table, particularly for same-day travel. For overnight travel the ATS estimates 8,561,000 U.S. visitors to Mexico in 1995, 45 percent of the travel estimated in the table. The ATS estimates a higher proportion of air travel because it counts longer

distance trips than in the table, trips that are more likely to be taken by airplane. The only estimates of bus travel are from the ATS, which estimates bus accounts for 3 percent of trips. The ATS estimates 51 percent of bus trips were taken by charter or tour bus, 46 percent by intercity bus and 3 percent by school bus. The ATS estimates less than 1 percent of overnight trips to Mexico were taken by intercity rail. For more information on the ATS, see <http://www.bts.gov/ats>

### **Table 9-2a Top Land Passenger Ports, Canadian-U.S. Border: 1996**

Northbound (Canadian data source): Statistics Canada. Culture, Tourism and the Center for Education Statistics Division. Special tabulations. (Ottawa, Ont.: 1998). Table 9-2a is based on data collected through Statistics Canada's Frontier Count program. These data provide information on the number of travelers by selected categories and by type of transportation. All ports of entry across Canada participate in determining the number of travelers by selected categories, by type of transportation, as well as the number of cars, trucks, motorcycles and bicycles in the case of highway and ferry points. These surveys are conducted on a census basis except for seven ports of entry that are using sampling schemes to estimate automobiles and motorcycle flows. The sample is intended to estimate United States and Canadian vehicles and travelers by country of residence. The samples are selected among the seven ports in order to represent all days of the month over the region. Custom officials at these ports provide the count of automobiles and cycle traffic by country of residence for those sample days. These counts are then weighted to the total flows provided by toll authorities.

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Southbound (U.S. data source). U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).

Data reflect all passenger vehicles and passengers in those vehicles that entered the United States across the U.S.-Canadian border, regardless of nationality.

**Table 9-2b**  
**Top Land Passenger Ports, Mexican-U.S. Border: 1996**

Northbound (U.S. data source): U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).

Data reflect all passenger vehicles and passengers that entered the United States across the U.S.-Mexican border, regardless of nationality.

Southbound: Data compiled by Texas A&M International University, Texas Center for Border Economic and Enterprise Development based on original data from bridge operators. Web site: [www.tamui.edu/coba/txcntr/](http://www.tamui.edu/coba/txcntr/)

**Table 9-3**  
**Top North American Air Passenger City Pairs: 1996**

**Canada-United States and Mexico-United States**

U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *T-100 Database*. Special tabulation. (Washington, DC: 1998).

Data for this table are based on regulatory reporting requirements for the large certificated U.S. air carriers and for foreign air car-

riers. The large certificated U.S. air carriers are required to report traffic data for all their aircraft operations, regardless of aircraft size. (See the technical notes under Table 4-2 for the definition of “large certificated air carrier.”) By contrast, the United States does not require foreign air carriers operating in the United States, such as Air Canada, to file “small aircraft” traffic operations. In the context of this table, small aircraft have 60 or fewer passenger seats and an available payload capacity (passengers and/or cargo) of 18,000 pounds (8,165 kilograms) or less. The United States requires foreign carriers operating in the United States to report data for aircraft with more than 60 passenger seats or available payload (passengers and/or cargo) of more than 18,000 pounds (8,165 kilograms).

**Table 9-4a**  
**Canada-Mexico/Mexico-Canada Travel by Trip Purpose**

Canadian data source: Statistics Canada. *International Travel, travel between Canada and other countries* (Touriscope), Catalogue 66-201-XPB. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

Also see notes for Table 9-1a. Under Statistics Canada’s International Travel Program, trip purposes include the following: pleasure, business, visiting friends or relatives and other purposes. A pleasure trip includes a holiday, vacation, visiting second home, cottage or condo and attending events and attractions. A business trip includes attending a meeting or convention, a conference, trade show or seminar, or other work. A trip for other purposes includes personal, in transit, shopping, educational study and other.

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Mexican data source: Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

See notes for Table 9-1a.

**Table 9-4b**  
**Canada-United States/United States-Canada Travel by Trip Purpose**

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope), Catalogue 66-201-XPB.* (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 9-1a and 9-4a.

**Table 9-5a**  
**Canada-Mexico/Mexico-Canada Travel Characteristics: 1996**

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope), Catalogue 66-201-XPB.* (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 9-1a and 9-4a.

**Table 9-5b**  
**Canada-United States/United States-Canada Travel Characteristics: 1996**

**Canada**

Statistics Canada. *International Travel, travel between Canada and other countries (Touriscope), Catalogue 66-201-XPB.* (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 9-1a and 9-4a.

**SECTION 10: INTERNATIONAL PASSENGER TRAVEL BETWEEN NORTH AMERICA AND THE REST OF THE WORLD**

**Table 10-1**  
**Passenger Travel Between North America and the Rest of the World by Mode of Transportation**

**All Countries**

Canadian, Mexican and U.S. data in this table do not include international travel within North America. All data in this table are based on the traveler's country of residency. Residents of a country are those people that are entitled to live permanently in that country. For the purposes of the travel data included in this section, resident travel would include travel by both citizens of the particular country, as well as, residents of that country. Canadian data represent nonresident visitors to Canada, excluding residents of the United States and Mexico. U.S. data represent nonresident visitors to the United States, excluding residents of Canada and Mexico. Mexican data represent nonresident visitors to Mexico, excluding residents of Canada and the United States.

Travel from the United States is based on the departures of U.S. residents, excluding travel to Canada or Mexico. Travel from Mexico is based on the departures of Mexican residents, excluding travel to Canada or the United States. Travel from Canada is based on Canadian resident reentry data. Canadian resident reentry data represent Canadian residents returning from international destinations, other than the United States or

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Mexico. The reentry of Canadian residents to Canada may be made directly from an overseas country or via the United States. Canadian resident reentry data are similar, but not exactly comparable with U.S. and Mexican resident departure data. This is because Canadian residents may not necessarily leave and return by the same modes of transportation, and because Canadian residents could depart Canada in one calendar year, and return in another.

### **Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope), Catalogue 66-201-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

Table 10-1 is based on data collected through Statistics Canada's Frontier Count program. These data provide information on the number of travelers by selected categories and by type of transportation. All ports of entry across Canada participate in determining the number of travelers by selected categories, by type of transportation, as well as the number of cars, trucks, motorcycles and bicycles in the case of highway and ferry points. These surveys are conducted on a census basis except for seven ports of entry that are using sampling schemes to estimate automobiles and motorcycle flows. The samples are selected among the seven ports in order to represent all days of the month over the region. Custom officials at these ports provide the count of automobiles and cycle traffic by country of residence for those sample days. These counts are then weighted to the total flows provided by toll authorities.

In Table 10-1, Canadian data are based on the traveler's country of residency. Travel

to Canada represents nonresident visitors to Canada, excluding residents of the United States and Mexico. Travel from Canada is based on Canadian resident reentry data. Canadian resident reentry data represent Canadian residents returning from international destinations, other than the United States or Mexico. The reentry of Canadian residents to Canada may be made directly from an overseas country or via the United States. Canadian resident reentry data are similar, but not exactly comparable with U.S. resident departure data. This is because Canadian residents may not necessarily leave and return by the same modes of transportation, and because Canadian residents could depart Canada in one calendar year, and return in another.

### **Mexico**

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

Table 10-1 is based on data collected by the Banco de México. Most of this data are collected through survey instruments. Overall, the goals of the Banco de México tourism survey program are to collect tourism data as part of the calculation of the balance of payments and to collect other information in order to analyze the behavior of tourists. To support these goals, data on expenses on local transportation, lodging, food, amusement, personal care items, souvenirs, medical care and other purchases are gathered. In addition, data such as length of stay, income level, purpose of trip, means of transportation, point of departure and major cities visited also are gathered. Through a sample survey data are collected at specific international airports and border cities. Data are collected from travelers in automobiles, buses, trains, as well as travelers boarding and deboarding

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aircraft. Each individual traveler is surveyed when leaving the country.

For the purposes of its own survey program, the Banco de México uses specific definitions to categorize types of visitors. However, due to the need for use of common terminology in Sections 9 and 10, some standard categories were used for the data tables. The category *Travel to Mexico (Nonresident Visitors)* represents nonresident visitors to Mexico, excluding residents of the United States and Canada. The category *Travel from Mexico (Mexican Residents)* includes departures from Mexico by Mexican residents.

### **United States**

U.S. Department of Commerce. International Trade Administration. Tourism Industries Office. *Summary of International Travelers to the U.S. and 1996 Outbound Travel*. (Washington, DC: 1997).

*Travel to the United States:* Travel to the United States represents travel by visitors who are not U.S. residents. Nonresident visitor data are based on international arrivals by air to the United States. These data are collected by the Immigration and Naturalization Service (INS) on form I-94. Canadian and Mexican residents are excluded from the data in Table 10-1 for nonresident visitors traveling by air to the United States. The INS data system makes it impossible to obtain data for other modes without including travel by Canadian and Mexican residents. The INS estimates that in 1996, 303,000 visitors (including residents of Canada and Mexico) came to the United States by water transportation. In 1995, visitors by water transportation were 269,000 and in 1990, 279,000.

*Travel from the United States:* Travel from the United States represents departures by U.S.

residents. U.S. resident departures data by air are primarily based on data collected by the Immigration and Naturalization Service (INS) on form I-92, supplemented by the *Survey of International Air Travelers*, which is conducted by the International Trade Administration (ITA) at the Department of Commerce. The I-92 is completed by air carriers, and provides data for the number of U.S. residents traveling abroad by air. The *Survey of International Air Travelers* provides data on the travel characteristics of U.S. residents traveling abroad by air. Figures for U.S. resident departures in Table 10-1 excludes U.S. residents who were departing to Canada and Mexico.

Data for travel from the United States in Table 10-1 are based on the number of resident departures by air, and not the number of country visits. In addition, the total number of air passengers (travel to and from the United States) in this table is based on a roundtrip and, therefore, differs from the total number of air passengers shown in Table 10-3, which is based on a one-way trip. In Table 10-1 U.S. residents traveling abroad are counted only once when they leave the country, and foreign residents are counted only once when they enter the country. In Table 10-3 U.S. residents are counted twice: once when leaving and once when returning. Similarly, foreign residents are counted twice: once when entering and once when leaving. Other differences between this table and Table 10-3 are due to the differing data sources. (Table 10-1 is based on immigration data, supplemented by an air travel survey. Table 10-3 is based on air carrier data.)

**Table 10-2**  
**Top International Origins and**  
**Destinations Outside of North**  
**America: 1996**

**All Countries**

Data in this table do not include international travel within North America. For Canada, the United States and Mexico are not included as destinations. For the United States, Mexico and Canada are not included as destinations. For Mexico, Canada and the United States are not included as destinations. In addition, destination country data for all three countries include visits by their residents to one or more countries outside North America.

For countries of origin, Canadian data exclude residents of Canada, the United States and Mexico, even if the travel of a Canadian, U.S. or Mexican resident originated in a third country, such as the United Kingdom. Similarly, for countries of origin, U.S. data exclude residents of the United States, Canada and Mexico, even if the travel of a U.S., Canadian or Mexican resident originated in a third country, such as the United Kingdom. Mexican data for regions of origin exclude residents of Canada, the United States and Mexico.

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope), Catalogue 66-201-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

Also see technical notes for Table 9-1a.

*Country of origin:* Canada Customs counts nonresident travelers upon their entry into Canada. A selected sample of these nonresi-

dents receive a travel questionnaire that ask a number of selected questions pertaining to the type of trip taken (travel characteristics). One such characteristic is the residency of the respondent and the length of stay while in Canada. Country of origin data in this table are based on visits to Canada of one or more nights. Canadian data in Table 10-2 exclude residents of the United States and Mexico, even if the travel of a U.S. or Mexican resident originated in a third country, such as the United Kingdom.

*Destination country:* Destination country data reflect the reported places visited by Canadian residents while travelling to foreign destinations. Destination country visits are for at least one night. Canadian residents, upon their reentry to Canada, are sampled as to the travel characteristics of the trip just completed. Among the many travel characteristics asked of the Canadian traveler are what countries were visited and how much time was spent in each.

**Mexico**

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999). Information on the travelers country of origin and destination is not available because it is not processed. Therefore, data have been presented at the regional level. The region of origin or destination is based on the region furthest in distance from Mexico or the region where the traveler spent the most time.

**United States**

U.S. Department of Commerce. International Trade Administration. Tourism Industries Office. *Summary of International Travelers to the U.S. and 1996 Outbound Travel*. (Washington, DC: 1997).

*Country of Origin:* Origin country data represent the residency of international arrivals based on data collected by the Immigration and Naturalization Service (INS) on form I-94. The I-94 is a requirement of all international visitors to the United States with the exception of Canadians visiting the United States for less than 6 months and Mexicans travelling within the 40-kilometer border frontier zone. U.S. country of origin data in Table 10-2 exclude residents of Canada and Mexico, even if the travel of a Canadian or Mexican resident originated in a third country, such as the United Kingdom. U.S. origin country data are based on country of residency. Hence, if a citizen of France, who is a permanent resident of Germany, travels to the United States from his home in Germany, he will be recorded as a person coming from Germany.

*Destination Country:* Destination countries are based on data collected by the Immigration and Naturalization Service (INS) on form I-92, supplemented by the *Survey of International Air Travelers*, which is conducted by the International Trade Administration (ITA) at the Department of Commerce. The I-92 is completed by air carriers, and provides data for the number of U.S. residents traveling abroad by air. The *Survey of International Air Travelers* provides data on the travel characteristics of U.S. residents traveling abroad by air.

It should be noted that destination country data for the United States include *visits* by U.S. residents to one or more countries. For example, if a U.S. resident departed and flew first to the United Kingdom for 3 days, then went to France for another 7 days, and then returned to the United States, this person's travel would be counted twice, in terms of destination countries: once with a visit to the

United Kingdom and once with a visit to France. This methodology differs from the approach to calculate the overall number of U.S. international passengers (nonresident visitors plus resident departures) in Table 10-1 because Table 10-1 is based on the number of air travelers, and not the number of country visits, which is the basis of Table 10-2.

The Bureau of Transportation Statistics' 1995 American Travel Survey (ATS) also provides data on the amount of international overseas travel by U.S. residents. Data from this survey provide generally lower estimates of the amount of overseas travel by U.S. residents as well as a somewhat different ranking of destination countries. Part of the difference in the top ATS destination countries versus the top destination countries according to the *Survey of International Air Travelers* is that the ATS is based on overseas travel by all modes of transportation. The top ten ATS destinations (excluding Canada and Mexico) were, in thousands of visitors: United Kingdom (1,846), Bahamas (1,581), Jamaica (971), France (944), Italy (833), Germany (823), Japan (608), India (508) Bermuda (487) and Aruba (416).

**Table 10-3**  
**Top International Air Gateways,**  
**Excluding North American Travel: 1996**

**Mexico**

Aeropuertos y Servicios Auxiliares. *Resultado del Movimiento Aeroportuario. Enero-Diciembre, 1996.* (Mexico City, D.F.: 1997).

Data for this table are based on airline reports provided to the Aeropuertos y Servicios Auxiliares, which is the agency responsible for overseeing Mexico's major airports. One

of the most important uses of this information is to plan services at airports for both airlines and air passengers.

Data in this table differ from those in Table 10-1, because they are based on air carrier data reported to the Aeropuertos y Servicios Auxiliares. In contrast, the data in Table 10-1 are survey data collected as part of the Banco de Mexico's tourism and travel program. For more information on this program see the notes for Table 9-1a and 9-1c.

### **United States**

U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *T-100 Database*. (Washington, DC: 1998).

These data are based on regulatory air carrier data and represent the total passengers (both outbound and inbound traffic in flight segments) in scheduled and nonscheduled service of all U.S. and non-U.S. airlines to and from all international cities (other than Canadian and Mexican cities). This data source is different from the data source used for Table 10-1 that shows the number of international passengers by air (a sum of nonresident visitors and resident departures). Table 10-1 is based on immigration data, supplemented by an air travel survey. Table 10-3 is based on air carrier data and the number of passengers (regardless of country of residency).

In addition, data for international air travel differ between Table 10-1 and Table 10-3 because the total number of air passengers with international origins and destinations in this table is based on a round-trip and, therefore, differs from the number of air passengers (a sum of nonresident visitors and resident departures) shown in Table 10-1, which is based on a one-way trip. Because Table

10-3 is based on air carrier data, a traveler is counted twice: once when leaving and once when returning. In Table 10-1, however, the U.S. traveler is counted only once when she leaves the country, and a foreign (nonresident) traveler is counted only once when he enters the country.

In Table 10-3, New York consists of three airports (John F. Kennedy International (16.3 million international passengers), Newark (3.7 million) and La Guardia (0.2 million)). Washington, DC consists of 2 airports (Dulles International (2.5 million) and National (0.02 million)). Data for Guam were not included in this table, but if they were, Guam would rank number 7 with 2.97 million international passengers.

## **SECTION 11: TRANSPORTATION INFRASTRUCTURE**

### **Table 11-1 Domestic Physical System Extent**

#### **All Countries**

For road, the overall total for Canada and the United States includes all roads (highways, local and others). However, the road total for Mexico does not include local roads. For the road subcategories, Canada cannot disaggregate its data for local roads into paved and unpaved. The rail data represent the length of track, including yard tracks, sidings and parallel lines. The transit rail data refer to one-way, fixed guideways.

#### **Canada**

Table 11-1 is based on the following primary sources:

Road: Transportation Association of Canada. *Transportation in Canada: A Statistical Overview—1995*. (Ottawa, Ont.: 1998).

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**Great Lakes and inland waterways:** Transport Canada. *Marine Distance Library, 1997*. (Ottawa, Ont.: 1998).

**Pipeline:** Statistics Canada. *Oil Pipeline Transport, Catalogue 55-201-XPB and Gas Utilities, Transport and Distribution Systems, Catalogue 57-205-XPB*. (Ottawa, Ont.: various years).

**Rail:** Statistics Canada. *Rail in Canada, Catalogue 52-216-XPB*. (Ottawa, Ont.: various years).

**Road:** It is not possible to present data according to the subcategories of major roads and local roads, which are included in Table 11-1. However, an overall total number as well as an overall number for paved and unpaved roads is available. For these figures, road length is based on a concept of a “two lane equivalent,” where a “two-lane equivalent” is a length of road measured as if there were only two lanes. For example, in this table, a 1-kilometer stretch of road with two regular lanes and one passing lane down the middle counts as 1.5 kilometers. Data for 1996 do not exist because the source of this data for 1990 and 1995 in Table 11-1 was a report entitled *Transportation in Canada: A Statistical Overview*, prepared for the Transportation Association of Canada (TAC), under contract. This particular report followed two earlier TAC publications: *Highways in Canada*, last published in 1991 and *Transportation in Canada*, last published in 1993. It is not known when a subsequent edition of *Transportation in Canada; A Statistical Overview*, will be issued or whether a subsequent edition will contain road extent data beyond year 1995.

The public road network in Canada extends slightly more than 900,000 kilometers. Approximately 35 percent of the network is paved, 57 percent has a gravel surface (in-

cluding “surface treatment”) and only 8 percent remains unsurfaced (such as dirt and winter roads. Winter roads are roads that are built in the winter over frozen lakes, rivers and muskeg). The Canadian National Highway System (NHS) consists of 24,449 route-kilometers of roads linking major cities, major international border crossings and ports. Although it comprises less than 3 percent of the Canadian road network, the Canadian National Highway System supports the bulk of both the interprovincial and international trade in goods and inter city passenger travel.

**Great Lakes and inland waterways:** Distances for the Great Lakes and inland waterways were calculated with use of an automated marine distance library developed by the Economic Analysis Directorate of Transport Canada. The total distance of Canada’s inland Waterways (2,825 kilometers) includes that distance along the St. Lawrence River from the Ontario-Québec border, along Québec’s north shore to the meridian of latitude 63° West (a distance of 1,029 kilometers) and the distance in U.S. waters in the Great Lakes system (1,796 kilometers).

The Great Lakes Region consists of those Canadian ports that are located along the St. Lawrence River west of the Ontario-Québec border, and on the four Great Lakes, which include Lake Ontario, Lake Erie, Lake Huron and Lake Superior. Canada’s Inland Waterways Region consists of all rivers, lakes and other navigable fresh waters within Canada including the St. Lawrence River as far seaward as a straight line drawn from Cap-des-Rosier to West Point, Anticosti Island, and from Anticosti Island to the north shore of the St. Lawrence River along the meridian of longitude 63° West. This area excludes the Mackenzie River and its tributaries, but includes time spent in U.S. waters of the St.

Lawrence River and the Great Lakes, where the St. Lawrence River Region consists of Canadian ports located on the St. Lawrence River from the Ontario-Québec border eastward, along the north shore to 63° West.

*Pipeline:* Natural gas pipeline data include pipeline used for the gathering, transmission and distribution of natural gas, but exclude gathering lines for the upstream producing industry. The length of natural gas pipeline also excludes pipeline used for the residential distribution of natural gas. Crude oil pipeline data include pipelines used for gathering, trunk-crude and product lines, but exclude upstream producers' gathering lines.

*Rail:* Data include freight and intercity passenger rail only. Rail track length for 1990 and 1995 includes rail lines owned or operated under lease, contract, trackage rights, or jointly owned and includes mainline, branch line and yard trackage. Data for 1995 indicate the length of track operated as of December 31, 1994.

### **Mexico**

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Evaluación. *Longitud de la Infraestructura Carretera, 1990, 1995 y 1996.* (Mexico City, D.F.: various years).

Pipeline: Instituto Nacional de Estadística, Geografía e Informática, based on data from the Petróleos Mexicanos. Subdirección de Planeación and the *Anuario Estadístico* (various years). (Aguascalientes, Ags.: various years).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 y 1996.* (Mexico City, D.F.: various years).

Transit: Instituto Nacional de Estadística,

Geografía e Informática, based on data collected by the Sistema de Transporte Colectivo and the Sistema de Transporte Eléctrico in Mexico City, the Sistema de Transporte Colectivo de la Zona Metropolitana in Guadalajara, and the Sistema de Transporte Colectivo in Monterrey. (Mexico City, D.F.: various years).

*Road:* The total length of the national road network includes toll and nontoll roads as well as feeder rural roads. Local roads within municipal areas are not included.

*Rail:* The total length of rail under operation, including main, secondary and private railroads.

*Transit:* Data include the Sistema de Transporte Colectivo, Mexico City's tramway and Guadalajara's and Monterrey's electric trains (Metrorrey).

### **United States**

Table 11-1 is based on the following primary sources:

Road: U.S. Department of Transportation. Federal Highway Administration (FHWA). Special tabulation. (Washington, DC: 1998).

Great Lakes and inland waterways: U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).

Gas pipeline: American Gas Association. *Gas Facts.* (Arlington, VA: 1997). Table 5-1 and similar tables in earlier editions.

Oil pipeline: Eno Transportation Foundation, Inc. *Transportation in America.* (Lansdowne, VA: 1997). Page 64.

Freight rail: Association of American Railroads. *Railroad Facts.* (Washington, DC: 1997). Page 44.

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Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996). Statistical Abstract.

Transit rail: American Public Transit Association. *Transit Fact book 1996*. (Washington, DC: 1996).

*Road*: Road data for “major roads” include U.S. Interstate and arterials. Data for local roads include both collectors and local roads. Data for 1990 and 1995 do not include Puerto Rico, but data for 1996 do include Puerto Rico in all road categories.

*Great Lakes and inland waterways*: Data represent an estimated length of the U.S. Great Lakes and inland waterways on which commercial traffic was reported to the U.S. Army Corps of Engineers. Great Lakes data refer to domestic commercial traffic between U.S. Great Lakes ports. Inland waterways are defined as those geographically located within the boundaries of the contiguous 48 states or within the boundaries of the State of Alaska.

*Pipeline*: Gas pipeline data include transmission pipelines, distribution, main and field gathering lines, but exclude service pipes. Gas pipeline data are not adjusted to common diameter equivalent, and data are reported at the end of each year. Oil pipeline data include petroleum and other liquid product lines, including gathering lines.

*Rail*: Rail data include length of track owned, including yard tracks, sidings and parallel lines by the National Railroad Passenger Corporation (Amtrak) and Class I freight railroads. Class I railroads have annual gross operating revenues in approximate excess of \$250 million (based on 1991 dollars) and comprise only 2 percent of the railroads in the U.S., but account for about 70 percent of

the industry’s distance operated (73 percent in 1996), 90 percent of its employees and 90 percent of its freight revenues. Portions of the freight, intercity passenger and commuter rail networks share common trackage in the United States. Jointly used rail track is only counted once in U.S. statistics.

*Transit rail*: Transit rail data include commuter rail, heavy rail and light rail. Data are one-way, fixed guideway.

## **Table 11-2 Number of Airports**

For all countries, data in Table 11-2 *do not* include heliports, stolports (an airport specifically designed for short take-off and landing aircraft, separate from conventional airport facilities) and seaplane bases.

### **Canada**

Table 11-2 is based on the following primary sources:

All data, except percent of control towers: Natural Resources Canada. *Canada Flight Supplement*. (Ottawa, Ont.: 1998). Airport facilities information provided to Natural Resources Canada for publication in *Canada Flight Supplement* by NAV CANADA. 1998.

Percent with control towers: Transport Canada. *Aircraft Movement Statistics, TP577*. (Ottawa, Ont.: 1998).

The number of Canadian heliports is excluded from the data in Table 11-2. In 1990 there were 314 heliports; in 1995 and 1996, there were 313. Of these heliports, there were 204 (1990), 210 (1995) and 211 (1996) heliports that were either certified and/or operated by the Canadian Department of National Defense.

In Canada, an aerodrome is a generic name for facilities that are registered with Trans-

port Canada as aircraft landing and take-off sites. Aerodromes are identified and described in *Canada Flight Supplement*, a publication produced on a monthly basis, under the authority of Nav Canada and Canada's Chief of Defense Staff, by Geometrica Canada, Department of Natural Resources. Most of Canada's commercial aviation activity takes place at certified airports. Some aerodromes are privately owned but the majority of the certified airports in Canada are owned by municipalities, provincial/territorial governments, or the federal government.

### Mexico

Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1997).

*Certified airports:* Data represent those airports managed by Aeropuertos y Servicios Auxiliares, the Secretaría de Comunicaciones y Transportes, the Secretaría de la Defensa Nacional (Ministry of National Defense), the Secretaría de Marina (Ministry of the Navy), and state and municipal governments.

### United States

Table 11-2c is based on the following primary sources:

U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation 1996*. (Washington DC: 1997). Web site: [api.hq.faa.gov/handbook/1996/toc96.htm](http://api.hq.faa.gov/handbook/1996/toc96.htm)

U.S. Department of Transportation. Federal Aviation Administration. *Administrator's Fact Book*. (Washington, DC: December 1993 and August 1998).

U.S. Department of Transportation. Federal Aviation Administration. Private Communication. (Washington, DC: 1998).

*Total airports:* Data for the number of total airports in Table 11-2 include only civilian

and joint-use civilian-military airports in the United States and its territories. Purely military airports are excluded. These data *do not* include heliports, stolports (an airport specifically designed for short take-off and landing aircraft, separate from conventional airport facilities) and seaplane bases. If data for heliports, stolports and seaplane bases were added to the number of civilian and joint-use airports, the total would be: 1990: 17,490; 1995: 18,224; and 1996: 18,292.

*Certified airports:* Data for certified airports are based on those airports that serve air carrier operations with aircraft seating more than 30 passengers. In 1990, there were 680 certified civilian, joint-use civilian-military and military airports. A breakout of civilian and joint-use certified airports versus purely military certified airports is not available for earlier than 1994. In 1994 and 1995, there were 95 purely military certified airports and in 1996, there were 94 purely military certified airports.

*Data sources:* The data are based on information collected by the FAA Office of Airport Safety and Standards "through physical inspections and mail solicitations, and reported on the *Airport Master Record* (Form FAA 5010-1) and the *FAA Landing Facilities Information Request on Airports, Heliports, Stolports, and Seaplane Bases* (Forms FAA 5010-2 and 5010-5)." For additional definitions and more information on U.S. airports, see chapter three of the *FAA Statistical Handbook of Aviation*.

### Tables 11-2a, b and c Top Airports by Flight Operations: 1996

Canadian and U.S. data in Tables 11-2a and 11-2c report the total number of *civilian itinerant operations* of commercial air carriers

and general aviation. Military operations and local operations have been excluded. Definitions of local and itinerant operations are as follows:

*Local:* Local operations are performed by aircraft that:

- (1) Operate in the local traffic pattern or within sight of the airport
- (2) Are known to be departing for, or arriving from, flight in local practice areas located within a 20-mile (32-kilometer) radius of the airport
- (3) Execute simulated instrument approaches or low passes at the airport.

*Itinerant:* Itinerant operations are all aircraft operations other than local operations. Mexican data in Table 11-2 b report the total number of civilian local *and* itinerant operations of commercial air carriers and general aviation. This differs from U.S. and Canadian data in Tables 11-2a and 11-2c where local operations have been excluded. However, the above definitions of local and itinerant still apply.

#### **Table 11-2a**

##### **Top 20 Canadian Airports by Flight Operations: 1996**

###### **Canada**

Table 11-2a is based on the following primary sources:

Flight operations: Transport Canada. *Aircraft Movement Statistics, TP 577*. (Ottawa, Ont.: 1998).

Airport characteristics: Natural Resources Canada. *Canada Flight Supplement*. (Ottawa, Ont.: 1998) Airport facilities information provided to Natural Resources Canada for

publication in *Canada Flight Supplement* by NAV CANADA. 1998.

#### **Table 11-2b**

##### **Top 20 Mexican Airports by Flight Operations: 1996**

###### **Mexico**

Aeropuertos y Servicios Auxiliares. *Resultado del Movimiento Aeroportuario, Enero-Diciembre de 1996*. (Mexico City, D.F.: 1997).

The number of flight operations includes scheduled and nonscheduled commercial aviation and general aviation at airports managed by the Aeropuertos y Servicios Auxiliares.

#### **Table 11-2c**

##### **Top 20 U.S. Airports by Flight Operations: 1996**

###### **United States**

This table is based on the following primary sources:

U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation-1996*. (Washington DC: 1997). Web site: [api.hq.faa.gov/handbook/1996/toc96.htm](http://api.hq.faa.gov/handbook/1996/toc96.htm)

Flight operations: U.S. Department of Transportation. Federal Aviation Administration. Office of Aviation Policy and Plans. Information Systems Branch. Private Communication. (Washington, DC: 1998).

Airport characteristics: U.S. Department of Transportation. Federal Aviation Administration. Office of Airport Safety and Standards. Airport Safety and Operations Division, based on FAA Airport Master Record, Form FAA 5010. Special tabulation. (Washington, DC: 1998).

See also the G.C.R. & Associates, Inc. web site: [www.gcr1.com/](http://www.gcr1.com/) (Click on Links and then on FAA 5010 Database.)

The data on number of flight operations (i.e., number of takeoffs plus number of landings) are reported to the FAA by the airport traffic control towers. The FAA *Statistical Handbook of Aviation* reports itinerant plus local operations. However, for this table, the FAA supplied an unpublished list showing total civilian *itinerant* operations. The FAA *Statistical Handbook of Aviation* also reports a great deal of information on the U.S. airspace system, including the top 50 airports (technically, the top 50 FAA-Operated Airport Traffic Control Towers) ranked in order of total operations, with the data broken out by aviation category (air carrier, air taxi, general aviation, military). Detailed data on activity at individual facilities can be found in the report, FAA *Air Traffic Activity*.

**Table 11-3**  
**Number of Water Ports and Facilities**

**Canada**

Statistics Canada. Transportation Division. Special tabulation. (Ottawa, Ont.: 1998).

*Total ports:* Data for the total number of ports in this table include marine ports or facilities reporting domestic and international cargo as reported on either Statistics Canada's *Domestic Shipping Report* or Revenue Canada's Customs Declarations. (See notes for Table 11-4a for a description of statistical instruments used by Statistics Canada to report domestic and international cargoes that are handled by Canadian ports).

*Definitions of regions:* The Atlantic region consists of Canadian ports on the Atlantic Ocean and Arctic Waters, and that portion of the Gulf of St. Lawrence that is east of the inland waters as defined in the Canadian Shipping Act. Data for Canadian Atlantic ports in this table include ports in Canadian Arctic waters and facilities that are located at Hibernia and Sable Island (offshore drilling sites). The Pacific region consists of Canadian ports located on the Pacific Coast. The Great Lakes Region consists of Canadian ports located along the St. Lawrence River west of the Ontario-Québec border, and on the Great Lakes. Data for Canadian inland ports in this table include ports located on the St. Lawrence River and the Mackenzie Delta. (The St. Lawrence River Region consists of Canadian ports located on the St. Lawrence River from the Ontario-Québec border eastward, along the north shore to 63° west longitude and along the south shore to Cap-des-Rosiers.)

**Mexico**

Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

The number of ports includes the oil facilities located in Cayo Arcas, in front of the coast of the state of Campeche.

**United States**

U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).

The number of U.S. ports for a particular year represents any U.S. port with annual activity of greater than one U.S. short ton, either do-

mestic or foreign. The only facility included in this count of ports and facilities is the Louisiana Offshore Oil Platform (LOOP). The category *Caribbean* includes ports in Puerto Rico and the U.S. Virgin Islands.

**Table 11-4a**  
**Top 20 Canadian Water Ports by Tonnage (Domestic and International): 1996**

**Canada**

Statistics Canada. *Shipping in Canada, Catalogue 54-205-XPB, 1996*. (Ottawa, Ont.: 1998).

Statistics Canada. Transportation Division. Special tabulations. (Ottawa, Ont.: 1998).

*Domestic tonnage:* Information on domestic shipping is collected from the *S.1 Domestic Shipping Report* and the *S.4 Towboat and Ferry Operators Shipping Report*. The S.4 report is used on Canada's west coast only. A record of activity is filed with Statistics Canada for each vessel entering or leaving a Canadian port in domestic shipping, with the exception of: cargo vessels under 15 net registered tons; tugs or other vessels under 15 gross register tons; Canadian naval or fishing vessels; research vessels; and ballast movements for towboat and ferry operators on the West Coast that are reporting on S.4 reports.

*International tonnage:* International commodity statistics are compiled from data collected on the A6 General Declaration and supporting cargo reports supplied to Statistics Canada by Revenue Canada, Customs and Excise, or equivalent reports from shipping lines and port authorities. Coverage extends to all vessels entering or leaving Canadian ports while engaged in international shipping with the exception of: fishing vessels of both

Canadian or foreign registry for which there is no foreign port reported on the A6 report; maintenance and service vessels such as ice-breakers; research vessels; and, other non-commercial vessels such as hospital ships. Data include intransit shipments.

*Containerized shipments/entrances and clearances:* The metric tonnage of total international and domestic containerized freight in 1996 was 17,911,000 metric tons. The total number of entrances and clearances of ships at all Canadian ports in 1996 was 93,170 ships.

**Table 11-4b**  
**Top 20 Mexican Water Ports by Tonnage (Domestic and International): 1996**

**Mexico**

Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Containerized cargo does not include the containers, only their contents. Data include in-transit shipments.

**Table 11-4c**  
**Top 20 U.S. Water Ports by Tonnage (Domestic and International): 1996**

**United States**

Tonnage: U.S. Army Corps of Engineers. *Waterborne Commerce of the United States, National Summaries, Part 5*. (New Orleans, LA: 1996).

Percent of containerized shipments: U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).

*Domestic tonnage:* Domestic tonnage data by port are based on domestic waterborne traffic movements that are reported to the U.S. Army Corps of Engineers (USACE) by all vessel operators of record. In summarizing domestic commerce, certain movements are excluded: cargo carried on general ferries; coal and petroleum products loaded from shore facilities directly into bunkers of vessels for fuel, and insignificant amounts of government materials moved on government owned equipment in support of USACE projects. Domestic tonnage data are based on the traffic of the contiguous and noncontiguous U.S. states and territories constituting the geographical space upon which domestic commerce may be transported. This includes Hawaii, Alaska, the 48 contiguous states, Puerto Rico and the Virgin Islands, Guam, American Samoa, Wake Island and U.S. Trust Territories. The subtotal for domestic tonnage of the top 20 ports represents the total tons moving in and out of the top 20 ports, excluding duplications. (For example, tonnage moving between Houston, TX and Corpus Christi, TX is counted only once in the subtotal for domestic tonnage of the top 20 ports.)

*International tonnage:* International tonnage data by port are primarily based on data for official U.S. international waterborne merchandise trade. This data include international merchandise imports to and exports from the United States that moved by water modes of transportation. In this table and in data reported by the U.S. Army Corps of Engineers, these data are supplemented by intransit shipments to provide port figures for international tonnage. Intransit shipments are shipments moving from one non-U.S. country to another non-U.S. country via a port or facility in the United States. Intransit shipments are not considered part of official U.S. international merchandise trade, but

these shipments do utilize and impact U.S. port infrastructure.

*Containerized shipments/entrances and clearances:* Data for containerized shipments are based on international containerized shipments plus domestic containerized shipments. Domestic containerized shipments are estimated based upon the vessel type and/or the vessel operating company moving the cargo. Commercial vessel movement into and out of water ports excludes fishing vessels. Data represent both loaded and unloaded vessels.

### **Table 11-5 Toll Roads, Bridges and Tunnels**

#### **Canada**

Table 11-5 is based on the following primary source:

Transport Canada. Highway Policy Group. Special tabulation. (Ottawa, Ont.: 1998).

Data in this table include 11 international bridges and 1 international tunnel on the U.S. Canadian border.

#### **Mexico**

Secretaría de Comunicaciones y Transportes. Dirección General de Evaluación. *Longitud de la Infraestructura Carretera, 1990, 1995 and 1996.* (Mexico City, D.F.: various years).

Data comprise the private sector (concessionaires), federal and state governments.

#### **United States**

U.S. Department of Transportation. Federal Highway Administration. *Toll Facilities in the United States: Bridges, Roads, Tunnels, Ferries.* (Washington, DC: various years).

Data are based on a survey of facilities (in operation, financed, or under construction)

conducted by the Federal Highway Administration in cooperation with state highway agencies. Data include Puerto Rico. Data are for January 1 of the reference year. Toll roads excludes the length of roadway on toll bridges/tunnels and parts of toll roads that are used toll free by local residents. Toll bridge facilities made up of more than one bridge are counted only once. Toll tunnel facilities made up of more than one tube are counted only once.

## SECTION 12: TRANSPORTATION VEHICLES

**Table 12-1**  
**Number of Transportation Vehicles/  
Equipment**

### All Countries

Data for the number of road motor vehicles are approached differently in each of the three countries. At the overall level, the data are comparable. However, for the specific road subcategories, there are some definitional differences between Canada, Mexico and the United States, especially in terms of light trucks. Light trucks include vehicles such as sports utility vehicles, vans, pick-up trucks, mini-vans and jeeps. In Canada, light trucks are included in the overall total for the number of road motor vehicles, but light trucks are not included in the Canadian data for personal vehicles or in the data for commercial freight vehicles. In the United States, light trucks are included within personal vehicles and can be differentiated from passenger cars. Therefore the U.S. and Canadian data for the number of personal vehicles are not exactly comparable. Mexico has included light trucks in both its overall total for road motor vehicles as well as in its total for personal vehicles, although light trucks cannot be differentiated from passenger cars. Light trucks

used for business purposes are included in Mexico's total for commercial freight vehicles, while those used for personal reasons are included in Mexico's total for personal vehicles.

### Canada

Table 12-1 is based on the following primary sources:

Air: International Civil Aviation Organization. *Civil Aircraft on Register. Digest of Statistics No. 437.* (Montréal, Que.: 1998).

Passenger cars, motorcycles, school buses: Statistics Canada. *Road Motor Vehicles, Registrations, Catalogue 53-219-XPB, 1997.* (Ottawa, Ont.: various years).

Charter, intercity and local motor buses: Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue 53-215-XPB.* (Ottawa, Ont.: various years).

Commercial freight vehicles: Statistics Canada. *Trucking in Canada, Catalogue 53-222-XPB.* (Ottawa, Ont.: various years).

Rail: Statistics Canada. *Rail in Canada, Catalogue 52-216-XPB.* (Ottawa, Ont.: various years).

Transit: Statistics Canada. *Passenger Bus and Urban Transit, Catalogue 53-215-XPB.* (Ottawa, Ont.: various years).

Water transport: Lloyd's Register of Shipping. *Statistical Tables—1990 Table 2 and World Fleet Statistics—Tables 2,* Editions 1995 and 1996. (London, UK: various years).

Air: Aircraft data in this table are based on regulatory definitions established by the Transportation Safety Board of Canada. Commercial aircraft include the following types of Canadian registered aircraft used by Canadian air operators that offer a "for-hire" service to transport people or goods, or to

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undertake specific tasks such as aerial photography, flight training and crop spraying: (1) airliner (2) commuter aircraft and (3) air taxi or specialty aircraft. For specific definitions of all of these commercial aircraft types, refer to the technical notes for Table 3-1. General aviation aircraft, as defined by the Transportation Safety Board of Canada, includes Canadian registered aircraft that are used by private operators, which include individuals flying for pleasure and companies flying for business reasons, or state operators, which include the federal and provincial governments. Canadian air data in Table 12-1 are from the International Civil Aviation Organization (ICAO) publication, *Aircraft Register*. This publication, *Aircraft Register*, inventories Canada's aircraft equipment by type (jet/nonjet) and use (air carrier/commercial operations or general aviation).

*Commercial aircraft:* In Table 12-1, commercial aircraft data include jets and nonjets. Jets include all commercial turbo-jet aircraft. Nonjets include all commercial propeller driven (turbine and piston) fixed wing type aircraft and all commercial rotary wing (turbine and piston) aircraft. Jet and nonjet Canadian commercial aircraft include Canadian registered aircraft that are used by Canadian air operators whose air operations are grouped by air carrier reporting levels I to VI (which includes a rating associated with the amount of revenue generated by their commercial air carrier operations).

*General aviation:* General aviation data include all noncommercial turbo-jet aircraft; all noncommercial propeller driven (turbine and piston) nonjet fixed wing type aircraft; and all noncommercial rotary wing (turbine and piston) aircraft.

*Road, total:* Under road data, overall totals include Canadian vehicle registrations recorded in the vehicle registration files of Canada's ten provinces and two territorial regions and compiled by Statistics Canada for its annual publication *Road Motor Vehicles—Registrations*. Vehicle type categories in Canada's registration files include: passenger automobiles (including taxis and for-hire cars); trucks and truck tractors; buses (separated between school buses and other); motorcycles; registered mopeds; and, "other road motor vehicles" (including vehicles such as ambulances, fire trucks etc.). These categories do not correspond directly with the vehicle type categories used in Table 12-1. Although the total includes all registered vehicles, the table categories of personal vehicles, buses and commercial freight vehicles are based on data that indicate *only a portion* of the total number of Canadian vehicle registrations.

*Road, personal vehicles (passenger cars, motorcycles and light trucks):* The total for personal vehicles represents only passenger automobiles and motorcycles. Passenger car data include registered passenger cars, taxis and for-hire cars. Motorcycle data include registered motorcycles and mopeds. Light trucks (such as mini-vans and pick-ups) are not a distinct category in Canada's vehicle registration files, but are included in the category of "trucks and truck tractors." Light trucks cannot be separated from the total number of "trucks and truck tractors" in Canada's vehicle registration files. Therefore, separate data for light trucks are non-existent and *no* light trucks have been included in the total for personal vehicles.

*Road, commercial freight vehicles:* The data in this category are based on two sources;

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provincial motor vehicle registration files and Statistics Canada's *Motor Carriers of Freight Survey*. In Canada's motor vehicle registration files, "commercial freight vehicles" is not a unique category. As a result, the total number of commercial freight vehicles, as well as the totals for the subcategories of single-unit trucks and tractors, are primarily derived from Statistics Canada's *Motor Carriers of Freight Survey*, supplemented with some data from vehicle registration files, as described below.

Data for single-unit trucks and tractors in Table 12-1 are based on data from Statistics Canada's *Motor Carriers of Freight Survey*. Data from this survey represent estimated numbers for single-unit trucks and tractors that are operated by owner operators and/or Canadian for-hire carriers (or trucking companies) that earn annual revenues greater than or equal to \$25,000 Canadian dollars.

Data for the total number of commercial freight vehicles are based on the data from the *Motor Carriers of Freight Survey* and on the supplementary vehicle registration data. The supplementary data from Canada's motor vehicle registration files represent "other motor vehicles," such as ambulances, fire trucks and specialized commercial motor vehicles. It should also be noted that the commercial freight vehicle data in Table 12-1 do not correspond to the "trucks and truck tractors" category in Canada's vehicle registration files. The "trucks and truck tractors" category in Canada's vehicle registration files includes smaller trucks, smaller truck tractors and light trucks (such as mini-vans and sports utility vehicles) and also includes trucks that are privately operated. These types of vehicles have been included *only* in the overall total for the number of road motor vehicles Table 12-1.

*Road, buses:* Buses include charter, intercity, local motor (or transit) and school buses. The overall bus total, as well as the number of school buses, is based on provincial and territorial vehicle registration files and reported in Statistics Canada's annual publication, *Road Motor Vehicles-Registrations*. Bus data for charter, intercity and local motor buses are based on a sample of Canadian companies engaged in scheduled intercity bus, urban transit, school bus and charter and other types of bus service (Statistics Canada's annual *Survey of the Passenger Bus and Urban Transit Industry*). Statistics Canada conducts this survey on a quarterly basis with an annual supplement. Prior to 1994, the survey program was restricted to those companies earning \$500,000 Canadian dollars or more. Beginning in 1994, the survey was expanded to include companies earning \$200,000 or more.

*Rail:* Rail data for freight cars include Canadian Class I and Class II railways. Freight locomotives include Class I and Class II railways and both freight and yard-type locomotives. Rail data for intercity passenger, train cars and locomotives include Class I (VIA Rail) and Class II railways.

*Transit:* Transit data are estimates of numbers of vehicles (revenue equipment operated), including rail transit vehicles and buses owned and leased, and are derived from a sample of Canadian companies engaged in urban transit bus service and used in Statistics Canada's annual *Survey of the Passenger Bus and Urban Transit Industry*. The total number of transit vehicles includes light rail transit vehicles, heavy rail transit vehicles, commuter rail vehicles and both "owned" and "leased" revenue motor bus vehicles operated for urban transit passenger service (i.e., standard motor bus, low floor

motor bus, trolley coach, articulated bus and other buses). Data for transit railcars include light rail vehicles, heavy rail vehicles and commuter rail vehicles.

*Water transport:* Lloyd's Register of Shipping has granted permission for use of their data on Canadian flag vessels for years 1990, 1995 and 1996. These data are published in Table 2 of Lloyd's Register, *Statistical Tables 1990* and in Tables 2A, 2B, 2C, 2D and 2E of Lloyd's Register, *World Fleet Statistics* (1996 and 1997 editions). The data on Canadian flag vessels that are published in the Lloyd's Registry are Canadian flag vessels, registered in Canada, in accordance with conditions identified in Sections 6, 7 and 8 of Part 1, *Canada Shipping Act* (Chapter S-9).

Other passenger vessels include passenger/ro-ro cargo and passenger/general cargo vessels. Tanker vessels include liquefied gas, chemical, oil, oil/chemical tankers and other liquid carriers. Dry bulk vessels include dry bulk, ore/bulk/oil carriers, ore/bulk carriers, self-discharging dry bulk, bulk and other dry bulk carriers. Specialized carrier vessels include specialized and refrigerated cargo carriers. General cargo includes general cargo, ro-ro cargo and other dry cargo vessels. Dry cargo/barge vessels include general cargo vessels and barges. Fishing vessels include fish catching, fishing (including factory ships) and other fishing vessels. Fishing vessels include fish catching, fishing (including factory ships) and other fishing vessels. However there is a considerable undercount of fishing vessels due to the exclusion of vessels under 15 gross registered tons. Offshore vessels include offshore supply and other offshore vessels. Other vessels include research, dredging and all other types of vessels.

## Mexico

*Air:* Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras, 1990-1996*. (Mexico City, D.F.: 1997).

*Rail:* Ferrocarriles Nacionales de México. *Series Estadísticas, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

*Road:* Instituto Nacional de Estadística, Geografía e Informática based on data collected by the Departamento del Distrito Federal, Dirección General de Autotransporte Urbano, Direcciones de Policía y Tránsito Estatales y Municipales. (Mexico City, D.F.: various years).

*Transit:* Instituto Nacional de Estadística, Geografía e Informática. Dirección de Estadísticas Económicas, based on data collected by the Sistema de Transporte Colectivo y Eléctrico in Mexico City, the Sistema de Transporte Eléctrico de la Zona Metropolitana in Guadalajara and the Sistema de Transporte Colectivo in Monterrey. (Mexico City, D.F.: various years).

*Water:* Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

*Air:* Commercial aircraft includes aircraft from scheduled, charter and freight airlines and air taxis. General aviation includes private and official aircraft. For 1990, 714 air taxis are included in the total for commercial aircraft. The corresponding numbers for 1995 and 1996 are 1,051 and 950, respectively. It is not possible to separate air taxis into jets and nonjets

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**Road:** Road data come from the statistics of the *Motor Vehicles Registered Under Circulation*. The subcategory of personal vehicles is comprised of private cars, some light trucks, cabs and official vehicles. The subcategory of commercial freight vehicles represents medium and heavy trucks and also may include some light trucks. Data for intercity buses and commercial freight vehicles represent only vehicles that are permitted, by regulation, to use the federal highway system.

**Rail:** Only a total for locomotives can be reported because they are used interchangeably, and not specifically dedicated to passenger or to freight trains.

### United States

Table 12-1 is based on the following primary sources:

#### Commercial aircraft:

U.S. Department of Transportation. Federal Aviation Administration. *Administrator's Fact Book*. (Washington, DC: August 1998 and December 1996).

U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation-1996*. (Washington DC: 1997). Web site: [api.hq.faa.gov/handbook/1996/toc96.htm](http://api.hq.faa.gov/handbook/1996/toc96.htm)

General aviation: U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation-1996*. (Washington, DC: 1997). Tables 8.1, 8.2, 8.3. Web site: [api.hq.faa.gov/handbook/1996/toc96.htm](http://api.hq.faa.gov/handbook/1996/toc96.htm)

U.S. Department of Transportation. Federal Aviation Administration. *General Aviation and Air Taxi Activity Survey*. (Washington DC: April 1998). Tables 1.1 and 1.3. Web site: [api.hq.faa.gov/ga96/gatoc.htm](http://api.hq.faa.gov/ga96/gatoc.htm)

Road: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Tables MV-1, 7, 9, 10 and 11.

Local motor bus: American Public Transit Association. *Transit Fact Book 1996*. (Washington, DC: 1996).

Transit rail: American Public Transit Association. *Transit Fact Book 1996*. (Washington, DC: 1996).

Freight rail: Association of American Railroads. *Railroad Facts*. (Washington, DC: 1997). Pages 48 and 50.

Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996). Statistical Abstract.

#### Water transport:

Recreational and fishing boats: U.S. Department of Transportation. U.S. Coast Guard. Office of Marine Safety. *Merchant Vessels of the United States*. (Washington, DC: 1998).

All other vessels: U.S. Army Corps of Engineers. Navigation Data Center. *Waterborne Transportation Lines of the United States, Calendar Year 1996*. (New Orleans, LA: 1997).

**Air:** The total number of aircraft has been rounded to the nearest 100 because the standard deviation in the number of general aviation aircraft does not allow greater precision. (See discussion below.)

**Commercial aircraft:** Data for commercial aircraft in Table 12-1 include *all* aircraft that are reported as being in operation by U.S. air carriers and that carry passengers or cargo for hire, both scheduled and nonscheduled service. On-demand air taxis *are* included with commercial aircraft in Table 12-1, as reported in the FAA *Administrator's Fact Book*.

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(Excluding on-demand air taxis, the commercial aircraft numbers are: 1990: 6,083; 1992: 7,320; 1995: 7,411; and 1996: 7,478. See Chapter 5 of the FAA *Statistical Handbook of Aviation* for more information on the U.S. air carrier fleet (including the jet/nonjet breakdown) when on-demand air taxis are excluded.) The commercial aircraft data in Table 12-1 were developed from reports collected by the FAA from the carriers; that is, the data are a *total count* of the aircraft reported to the FAA as being *used* in air carrier service. (Note that this is different from an inventory of aircraft *owned* by the air carriers.) The FAA keeps this data in its Vital Information System (VIS).

*General aviation:* General aviation data are based on a FAA mail survey, the *General Aviation and Air Taxi Activity (and Avionics Survey)* (hereafter referred to as *Survey*). This survey uses a scientifically designed random sample that represents all general aviation aircraft and on-demand air taxis registered in the United States. The *Survey* data include only aircraft in active use. The general aviation data in Table 12-1 exclude on-demand air-taxis because they have been included with commercial aircraft, as explained above. Because the general aviation data are derived from a sample, there is sampling error. Thus, in some of its tables, the FAA rounds the totals to the nearest 100. The standard deviation on the *Survey's* totals for general aviation aircraft plus on-demand air taxis is, however, considerably larger than 100. Standard deviations are given explicitly in the FAA *Statistical Handbook of Aviation*, chapter 8 and in the *Survey* itself.

As stated above, Table 12-1 combines on-demand air taxis and air carrier aircraft into the category commercial aircraft. Thus, to derive the numbers for general aviation in

Table 12-1, the *Survey's* data for on-demand air taxis have been subtracted from the *Survey's* totals for general aviation aircraft plus on-demand air taxis. (It is important to note that the *Survey* underestimates on-demand air taxis, and the *Survey's* numbers for on-demand air taxis do not agree with the on-demand air taxi data in the FAA's Vital Information System.) If numbers for on-demand air taxis from the *Survey* are *included* in the total for general aviation aircraft, the totals are, 1990: 196,800; 1992: 185,700; 1995: 182,600; and 1996: 187,300. These are the same totals that are reported for the number of general aviation aircraft plus on-demand air taxis in chapter eight of the FAA *Statistical Handbook of Aviation* and chapter one of the *Survey*.

*Road:* Road data are based on statistics compiled by the Federal Highway Administration (FHWA) at the U.S. Department of Transportation from reports submitted by the states. In 1995, FHWA revised the data series for the number of U.S. road vehicles. The new categories include passenger car, light trucks ("other 2-axle, 4-tire vehicles"), "single-unit 2-axle 6-tire or more truck" and combination truck tractors. Pre-1993 data were assigned to the closest available category. Data for light trucks or "other 2-axle, 4-tire vehicles" include vans, pick-up trucks and sport/utility vehicles. "Single-unit 2-axle 6-tire or more trucks" are on a single frame with at least two axles and six tires, and correspond to the category of single-unit trucks in Table 12-1. Combination truck tractors correspond to the category of tractors in Table 12-1. Passenger cars include taxis. The total for buses is based on FHWA estimates and include intercity, charter, school and local motor bus. The estimate of local motor buses is based on data from the American Public

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Transit Association (APTA) (see transit section for a description). All road data represent registered vehicles in the U.S., except local motor buses that are active passenger vehicles.

*Rail:* Rail data for rail freight include in-service freight cars and locomotives belonging to Class I railroads and car companies and freight shippers. Class I railroads have annual gross operating revenues in approximate excess of \$250 million (based on 1991 dollars) and comprise only 2 percent of the railroads in the U.S., but account for about 70 percent of the industry's distance operated, 90 percent of its employees and 90 percent of its freight revenues. Data for intercity passenger rail only include in-service intercity cars and locomotives. Of the total number of freight railcars in Table 12-1, a large share belong to shippers and railcar companies. In 1990, 658,902 freight cars belonged to shippers and rail car companies. In 1995 and 1996, the corresponding numbers were 583,486 and 570,865, respectively.

*Transit:* Transit data are from the American Public Transit Association (APTA) and are based on information in the Federal Transit Administration's (FTA) National Transit Database. APTA conservatively adjusts the FTA data to include transit operators that do not report to this database. These nonreporting operators typically include private, very small and/or rural operators. There are about 6,000 transit operators in the U.S., according to APTA. Only about 1,000 of these report to FTA. However, these 1,000 operators account for approximately 90 to 95 percent of the total transit passenger-kilometers. Reliability of the U.S. transit data varies by mode. The numbers for rail are the most comprehensive; those for bus are less so because there are so many more operators. Transit total includes other U.S. transit

categories not individually specified here, including local motor bus, ferries, and transit for the disabled. Transit railcars includes light railcars, heavy railcars and commuter rail cars and locomotives.

*Water transport:* Water data for all vessels, except other passenger vessels, recreational boats and fishing vessels, are based on U.S. Army Corps of Engineers (USACE) data. USACE data are derived from an annual survey of vessels available for operation in domestic waterborne trade as of December 31 of the respective year. USACE vessel data have been organized in this table according to the International Classification of Ship Type (ICST) system. The ICST category for "miscellaneous types, other" includes research vessels or dredges. Because the USACE data represent vessels engaged in waterborne commerce, research vessels and dredges, are excluded from USACE data. Therefore, the United States cannot provide data for this ICST category. USACE data also represent U.S. flagged vessels. A U.S. flagged vessel is one that is U.S. operated, but not necessarily U.S. owned.

Data on passenger vessels, recreational boats and fishing vessels are from the U.S. Coast Guard's (USCG) *Merchant Vessels of the United States* publication. Under USCG definitions a recreational boat is one used for pleasure purposes with a weight greater than 5 deadweight tons. The USCG defines fishing vessels as those that "commercially engage in the catching, taking, or harvesting of fish or an activity that can reasonably be expected to result in the catching, taking, or harvesting of fish." Data for other passenger vessels are obtained from the Coast Guard's Marine Safety Information System Database, and are considered noncruise passenger vessels.

**Table 12-2**  
**Vehicle-Kilometers by Mode**

**Canada**

Table 12-2 is based on the following primary sources:

Road: Transport Canada. *Transportation in Canada 1997—Annual Report*. (Ottawa, Ont.: 1998).

Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998).

Rail: Statistics Canada. *Rail in Canada, Catalogue 52-216-XPB*. (Ottawa, Ont.: various years).

Bus: Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue 53-215-XPB*. (Ottawa, Ont.: various years).

Domestic aircraft-kilometers for Canadian Level I to Level IV air carriers were last reported in 1987. Road vehicle-kilometers for personal vehicles and commercial freight vehicles (but not for bus) are based on a Transport Canada estimate for 1995 of the numbers of vehicle kilometers traveled by passenger motor vehicles, light trucks and commercial freight vehicles. Estimates of vehicle-kilometers are calculated based on: (1) road motor vehicle fuel sales (net sales on which taxes were paid at road-use rates); and (2) estimates of fuel efficiency by class of vehicle. Domestic intercity passenger rail kilometers include Class I and II services. All bus data are from a sample of Canadian companies engaged in scheduled intercity bus, urban transit, school bus and charter and other types of bus service from Statistics Canada's annual *Survey of the Passenger Bus and Urban Transit Industry*.

**Mexico**

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

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Air data include only kilometers traveled by national lines under scheduled operation in domestic and international service. Rail data include vehicle activity by the entire railroad system, which during the years 1990, 1995 and 1996 was operated by one company.

**United States**

Table 12-2 is based on the following primary sources:

Air carrier: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: 1986-1997). Page 2, Line 27, plus Line 50.

General aviation: U.S. Department of Transportation. Federal Aviation Administration. *General Aviation and Air Taxi Activity (and Avionics) Survey*. (Washington, DC: 1990, 1995 and 1996). Table 3.3. Web site: [api.hq.faa.gov/ga96/gatoc.htm](http://api.hq.faa.gov/ga96/gatoc.htm)

Road:

1990, 1995: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996). Table VM-201A.

1996: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Table VM-1.

Local motor bus: American Public Transit Association (APTA). *Transit Fact Book 1996*. (Washington, DC: 1996).

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**Transit:** American Public Transit Association. *Transit Fact Book 1996*. (Washington, DC: 1996).

**Freight rail:** Association of American Railroads. *Railroad Facts*. (Washington, DC: 1997). Page 33.

**Intercity passenger rail:** National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996). Statistical Abstract.

National Railroad Passenger Corp. State and Local Affairs Department and Public Affairs Department. Private communication. (Washington, DC: 1998).

**Air:** Air total includes data for domestic air carriers and general aviation. Air data for domestic air carrier vehicle-kilometers in the United States are based on 100 percent reporting of passengers and trip length by some 90 large certificated air carriers (including the medium regional carriers) that operate aircraft with a passenger seating capacity of more than 60, or have a payload capacity of more than 8,165 kilograms, or operate internationally. (For additional information on the definition of large certificated air carrier, see the technical notes for Table 4-2). The figures do not include data for all airlines; most notably, small certificated air carriers, scheduled commuter airlines and on-demand air taxis are excluded. If added, these might raise the totals by roughly 13 percent in 1995. In this table, general aviation includes on-demand air taxis, corporate flying, sightseeing and personal flying and some other forms of flying but excludes military flying. Vehicle miles are estimates derived from the Federal Aviation Administration's *General Aviation and Air Taxi Activity Survey*.

**Road:** Road data include passenger cars, motorcycles and light trucks. Passenger cars include taxis. Road data are based on statistics compiled by the Federal Highway Administration (FHWA) at the U.S. Department of Transportation from reports by the states. In 1995, the U.S. Department of Transportation, Federal Highway Administration (FHWA) revised its vehicle type categories for data from 1993 and later. The new categories include passenger car, the FHWA category "other 2-axle, 4-tire vehicles" (called "light truck" in this table), single unit trucks ("single-unit 2-axle 6-tire or more truck") and combination trucks. Pre-1993 data were assigned to the closest available category. Data for light trucks include vans, pick-up trucks and sport/utility vehicles. Single-unit trucks are on a single frame with at least two axles and six tires, and correspond to the category of single-unit trucks in Table 12-2. Combination truck tractors correspond to the category of tractors in Table 12-2. In January 1997, the FHWA published revised vehicle-kilometers data for the highway mode for several years. The major change reflected the reassignment of some vehicles from the passenger car category to the light truck category. Bus totals are based on data from the FHWA and include charter, intercity, local motor bus and school bus. Local motor bus data are based on data from a private association. (See below for a description.)

**Transit:** Transit data are from the American Public Transit Association (APTA) and are based on information in the Federal Transit Administration's (FTA) National Transit Database. APTA conservatively adjusts the FTA data to include transit operators that do not report to this database. These nonreporting

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operators typically include private, very small and/or rural operators. There are about 6,000 transit operators in the U.S., according to APTA—about 1,000 of these report to FTA. However, these 1,000 operators account for approximately 90 to 95 percent of the total transit passenger-kilometers. Reliability of the U.S. transit data varies by mode. The numbers for rail are the most comprehensive; those for bus are less so because there are so many more operators. Transit total includes other U.S. transit categories not individually specified here, including local motor bus, trolley bus, ferries and transit for the disabled. Transit rail includes commuter rail, heavy rail and light rail and is based on car-kilometers.

*Rail:* Rail freight train-kilometers are based on Class I railroads in the United States. Class I railroads had annual gross operating revenues in approximate excess of \$250 million (based on 1991 dollars) and comprised only 2 percent of the railroads in the U.S., but accounted for about 70 percent of the industry's distance operated, 90 percent of its employees and 90 percent of its freight revenues. Train-kilometers are based on the distance run between terminals and/or stations.



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a p p e n d i x C

# Reference Resources



# appendix C

## Reference Resources

This appendix provides additional reference materials for many of the data tables. Included in this appendix are: acronyms for data sources, currency exchange rates, state and provincial abbreviations, U.S.-metric conversion ratios, land port names for the Canadian-U.S. and Mexican-U.S. borders and the two-digit commodity codes and descriptions of the Harmonized Schedule for international merchandise trade.

### SOURCE ACRONYMS

This acronym list represents many of the Canadian, Mexican and U.S. government and nongovernment sources used in this publication, but should not be viewed as exhaustive. This list of acronyms should *not* be viewed as a comprehensive list of government or nongovernmental organizations and associations that maintain and analyze transportation and transportation related data in any of the three countries.

#### Canadian Identified Sources

##### *Canadian Government Agencies*

|                                      |  |
|--------------------------------------|--|
| NRCan                                | Natural Resources Canada                   |
| STC                                  | Statistics Canada                          |
| TSB                                  | Transportation Safety Board of Canada      |
| TC                                   | Transport Canada                           |
| <i>Nongovernmental Organizations</i> |  |
| CN                                   | Canadian National                          |
| CPR                                  | Canadian Pacific Railway                   |
| NAVCAN                               | NAV CANADA                                 |
| SLSMC                                | St. Lawrence Seaway Management Corporation |
| TAC                                  | Transportation Association of Canada       |

#### Mexican Identified Sources

|            |   |
|------------|---|
| INEGI      | Instituto Nacional de Estadística, Geografía e Informática (National Institute of Statistics, Geography and Informatics)                                    |
| DGCNES y P | Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios (General Directorate of National Accounts, Socioeconomic Studies and Prices) |
| DGE        | Dirección General de Estadística (General Directorate of Statistics)  |
| DCSE       | Dirección de Censos de Sectores Económicos (Directorate General of Economic Census)   |
| DECP       | Dirección de Estadísticas de Corto Plazo (General Directorate of Short Term Statistics)   |
| DEE        | Dirección de Estadísticas Económicas (Directorate of Economic Statistics)   |
| DGG        | Dirección General de Geografía (General Directorate of Geography)   |
| SCT        | Secretaría de Comunicaciones y Transportes (Ministry of Communications and Transportation)  |
| ASA        | Aeropuertos y Servicios Auxiliares (Airports and Auxiliary Services)  |

**Mexican Identified Sources—Continued**

|                    |  |
|--------------------|--|
| CGPMM              | Coordinati3n General de Puertos y Marina Mercante (General Coordination of Ports and Merchant Marine)  |
| DGAC               | Direcci3n General de Aeron3utica Civil (General Directorate of Civil Aeronautics)  |
| DGAF               | Direcci3n General de Autotransporte Federal (General Directorate of Federal Motor Carriers)  |
| DGP                | Direcci3n General de Planeaci3n (General Directorate of Planning)  |
| DGPFC              | Direcci3n General de Policia Federal de Caminos y Puertos (General Directorate of Federal Highway and Port Patrol)   |
| FERRONALES/<br>FNM | Ferrocarriles Nacionales de M3xico (National Railroads of Mexico)  |
| IMT                | Instituto Mexicano del Transporte (Mexican Institute of Transport)   |
| BANXICO            | Banco de M3xico (Bank of Mexico)   |
| CONAE              | Comisi3n Nacional para el Ahorro de Energ3a (National Commission for Energy Conservation)  |
| METROORREY         | Sistema de Transporte El3ctrico de la ciudad de Monterrey (Electric Public Transport (Transit, Trolley and Light Rail) System for the Monterrey Metropolitan Zone) |
| PEMEX              | Petr3leos Mexicanos (Mexican Petroleum Company)  |
| SE                 | Secretar3a de Energ3a (Ministry of Energy)   |

**Mexican Identified Sources—Continued**

|        |  |
|--------|--|
| SECOFI | Secretar3a de Comercio y Fomento Industrial (Ministry of Trade and Industrial Development)   |
| SECTUR | Secretar3a de Turismo (Ministry of Tourism)  |
| SHCP   | Secretar3a de Hacienda y Cr3dito P3blico (Ministry of Finance and Public Credit)   |
| SPP    | Secretar3a de Programaci3n y Presupuesto (Ministry of Planning and Budgeting)  |
| STC    | Sistema de Transporte Colectivo (Metro) (Public Transport (Transit) System for the Mexico City Metropolitan Zone)  |
| STE    | Sistema de Transporte El3ctrico (Electric Public Transport (Transit, Trolley and Light Rail) System for the Mexico City Metropolitan Zone)   |
| STEZMG | Sistema de Transporte El3ctrico de la Zona Metropolitana de Guadalajara (Electric Public Transport (Transit, Trolley and Light Rail) System for the Guadalajara Metropolitan Zone) |

**United States Identified Sources***U.S. Government Agencies*

|        |                                    |
|--------|------------------------------------|
| DOC    | Department of Commerce             |
| Census | U.S. Census Bureau                 |
| BEA    | Bureau of Economic Analysis        |
| ITA    | International Trade Administration |
| TIO    | Tourism Industries Office          |
| DOD    | Department of Defense              |
| USACE  | U.S. Army Corps of Engineers       |
| DOE    | Department of Energy               |

**United States Identified Sources**—*Continued*

*U.S. Government Agencies—Continued*

|       |  |
|-------|--|
| EIA   | Energy Information Administration              |
| ORNL  | Oak Ridge National Laboratory                  |
| DOL   | Department of Labor                            |
| BLS   | Bureau of Labor Statistics                     |
| DOT   | Department of Transportation                   |
| BTS   | Bureau of Transportation Statistics            |
| FAA   | Federal Aviation Administration                |
| FHWA  | Federal Highway Administration                 |
| FMCSA | Federal Motor Carrier Safety Administration    |
| FRA   | Federal Railroad Administration                |
| FTA   | Federal Transit Administration                 |
| MARAD | Maritime Administration                        |
| NHTSA | National Highway Traffic Safety Administration |
| OST   | Office of the Secretary                        |
| RSPA  | Research and Special Programs Administration   |
| STB   | Surface Transportation Board                   |
| SLSDC | St. Lawrence Seaway Development Corporation    |
| USCG  | United States Coast Guard                      |
| EPA   | Environmental Protection Agency                |
| NTSB  | National Transportation Safety Board           |

**United States Identified Sources**—*Continued*

*U.S. Nongovernmental Organizations*

|        |  |
|--------|--|
| AAR    | American Association of Railroads                |
| AGA    | American Gas Association                         |
| AMTRAK | National Railroad Passenger Corporation (Amtrak) |
| API    | American Petroleum Institute                     |
| APTA   | American Public Transit Association              |
| ENO    | ENO Transportation Foundation                    |
| TRB    | Transportation Research Board                    |

**International Organizations**

|                  |   |
|------------------|---|
| GATT             | General Agreement on Tariffs and Trade                |
| IMF              | International Monetary Fund                           |
| ICAO             | International Civil Aviation Organization             |
| Lloyd's Register | Lloyd's Register of Shipping                          |
| OECD             | Organization for Economic Cooperation and Development |
| UN               | United Nations  |
| WB               | World Bank  |
| WTO              | World Trade Organization                              |

**INTERNATIONAL CURRENCY EXCHANGE RATES**

|  | 1990   | 1995   | 1996   |
|--|--------|--------|--------|
| <b>Canada</b><br>(Units of Canadian dollars per U.S. dollar) | 1.1668 | 1.3724 | 1.3635 |
| <b>Mexico</b><br>(Units of Mexican pesos per U.S. dollar)    | 2.8126 | 6.4194 | 7.6009 |

Source: International Monetary Fund, *International Financial Statistics Yearbook 1997*, Period Averages of Market Exchange Rates. (Washington, DC: 1998)

## STATE AND PROVINCIAL ABBREVIATIONS

### Canadian Provinces, Territories and Abbreviations

| Province-Territory    | Abbreviation |
|-----------------------|--------------|
| Alberta               | Alta.        |
| British Columbia      | B.C.         |
| Manitoba              | Man.         |
| New Brunswick         | N.B.         |
| Newfoundland          | Nfld.        |
| Northwest Territories | N.W.T.       |
| Nova Scotia           | N.S.         |
| Nunavut*              | Nvt.         |
| Ontario               | Ont.         |
| Prince Edward Island  | P.E.I.       |
| Quebec                | Que.         |
| Saskatchewan          | Sask.        |
| Yukon Territory       | Y.T.         |

\*Effective April 1, 1999, Nunavut was created as an administrative/geographical region of Canada from partitioning of the Northwest Territories.

### Mexican States and Abbreviations

| Mexican state       | Abbreviation |
|---------------------|--------------|
| Aguascalientes      | Ags.         |
| Baja California     | B.C.         |
| Baja California Sur | B.C.S.       |
| Chihuahua           | Chih.        |
| Colima              | Col.         |
| Campeche            | Camp.        |
| Coahuila            | Coah.        |
| Chiapas             | Chis.        |
| Distrito Federal    | D.F.         |
| Durango             | Dgo.         |
| Guerrero            | Gro.         |
| Guanajuato          | Gto.         |
| Hidalgo             | Hgo.         |
| Jalisco             | Jal.         |
| Michoacán           | Mich.        |
| Morelos             | Mor.         |
| México              | Edo. de Méx. |
| Nayarit             | Nay.         |
| Nuevo León          | N.L.         |
| Oaxaca              | Oax.         |
| Puebla              | Pue.         |
| Quintana Roo        | Q. Roo       |

### Mexican States and Abbreviations—Continued

| Mexican state   | Abbreviation |
|-----------------|--------------|
| Querétaro       | Qro.         |
| Sinaloa         | Sin.         |
| San Luis Potosí | S.L.P.       |
| Sonora          | Son.         |
| Tabasco         | Tab.         |
| Tlaxcala        | Tlax.        |
| Tamaulipas      | Tamps.       |
| Veracruz        | Ver.         |
| Yucatán         | Yuc.         |
| Zacatecas       | Zac.         |

### U.S. States and Abbreviations

| U.S. state           | Abbreviation |
|----------------------|--------------|
| Alabama              | AL           |
| Alaska               | AK           |
| Arizona              | AZ           |
| Arkansas             | AR           |
| California           | CA           |
| Colorado             | CO           |
| Connecticut          | CT           |
| Delaware             | DE           |
| District of Columbia | DC           |
| Florida              | FL           |
| Georgia              | GA           |
| Hawaii               | HI           |
| Idaho                | ID           |
| Illinois             | IL           |
| Indiana              | IN           |
| Iowa                 | IA           |
| Kansas               | KS           |
| Kentucky             | KY           |
| Louisiana            | LA           |
| Maine                | ME           |
| Maryland             | MD           |
| Massachusetts        | MA           |
| Michigan             | MI           |
| Minnesota            | MN           |
| Mississippi          | MS           |
| Missouri             | MO           |
| Montana              | MT           |
| Nebraska             | NE           |
| Nevada               | NV           |
| New Hampshire        | NH           |

**U.S. States and Abbreviations—Continued**

| U.S. state     | Abbreviation |
|----------------|--------------|
| New Jersey     | NJ           |
| New Mexico     | NM           |
| New York       | NY           |
| North Carolina | NC           |
| North Dakota   | ND           |
| Ohio           | OH           |
| Oklahoma       | OK           |
| Oregon         | OR           |
| Pennsylvania   | PA           |
| Rhode Island   | RI           |
| South Carolina | SC           |

**U.S. States and Abbreviations—Continued**

| U.S. state    | Abbreviation |
|---------------|--------------|
| South Dakota  | SD           |
| Tennessee     | TN           |
| Texas         | TX           |
| Utah          | UT           |
| Vermont       | VT           |
| Virginia      | VA           |
| Washington    | WA           |
| West Virginia | WV           |
| Wisconsin     | WI           |
| Wyoming       | WY           |

**CONVERSION RATIOS FOR METRIC-U.S. MEASURES**

**Metric/U.S. Conversion Factors**

| Length   | Length   |
|--|--|
| 1 mile = 1.609 kilometers<br>1 foot = 0.3048 meters  | 1 kilometer = 0.6214 mile<br>1 meter = 3.281 feet  |
| <b>Area</b><br>1 square mile = 2.590 square kilometers   | <b>Area</b><br>1 square kilometer = 0.3861 square miles  |
| <b>Weight</b><br>1 U.S. short ton = 2,000 pounds = 0.9072 metric tons<br>1 pound = 453.6 grams             | <b>Weight</b><br>1 metric ton = 1,000 kilograms = 1.102 U.S. short tons<br>1,000 grams = 1 kilogram = 2.205 pounds |
| <b>Volume</b><br>1 cubic foot = 0.02832 cubic meters<br>1 gallon = 3.785 liters<br>1 BTU = 1055.056 joules | <b>Volume</b><br>1 cubic meter = 35.31 cubic feet<br>1 liter = 0.2642 gallons<br>1,000 joules = 0.9478 BTU         |

1 mile per gallon = 235.2 liters per 100 kilometers

Other conversion factor: 1 barrel = 42 gallons

## LAND PORT NAMES, CANADIAN-U.S. BORDER

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

| U.S. state | Canadian province | Border crossing   | Canadian port code   | U.S. port code   | Observations   |
|------------|-------------------|---|--|--|--|
| Alaska     | Yukon Territory   | <b>Alcan-Beaver Creek</b>   | 8902   | 3104   |  |
| Alaska     | British Columbia  | <b>Dalton Cache-Prince Rupert</b><br><b>Skagway-Whitehorse-Fraser</b>   | 8080<br>8904   | 3106<br>3103   |  |
| Washington | British Columbia  | <b>Point Roberts-Boundary Bay</b><br><b>Blaine-Douglas and Pacific Highway</b><br>Blaine-Douglas Highway<br><br>Blaine-Pacific Highway<br><br><b>Lynden-Aldergrove</b><br><b>Sumas-Huntington</b><br><br><b>Nighthawk-Chopaka</b><br><b>Oroville-Osoyoos</b><br><b>Ferry-Midway</b><br><b>Danville-Carson</b><br><b>Frontier-Paterson</b><br><b>Laurier-Cascade</b><br><b>Boundary-Waneta</b><br><b>Metaline Falls-Nelway</b> | 8161<br><br>8133<br><br>8131/8132<br><br>8174<br>8171/8173<br><br>8320<br>8191<br>8330<br>8161<br>8360<br>8162<br>8400<br>8340 | 3017<br>3004<br><br><br><br>3023<br>3009<br><br>3011<br>3019<br>3013<br>3012<br>3020<br>3016<br>3015<br>3025 | Passenger vehicles/buses/passengers<br>(Commercial/traffic operations<br>westbound)<br><br>Passenger vehicles/buses/passengers<br>(Commercial/traffic operations<br>westbound)<br><br>(Commercial/traffic operations<br>westbound) |
| Idaho      | British Columbia  | <b>Porthill-Rykerts</b><br><b>Eastport-Kingsgate</b>  | 8370<br>8181   | 3308<br>3302   |  |
| Montana    | British Columbia  | <b>Roosville-Grasmere</b>   |  | 3318   |  |
| Montana    | Alberta           | <b>Piegan-Carway</b><br><b>Del Bonita-Del Bonita</b>  | 7053<br>7055   | 3316<br>3322   |  |

**LAND PORT NAMES, CANADIAN-U.S. BORDER**—Continued

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

| U.S. state             | Canadian province | Border crossing             | Canadian port code | U.S. port code | Observations |
|------------------------|-------------------|-----------------------------|--------------------|----------------|--------------|
| Montana—Con.           | Alberta—Con.      | <b>Sweetgrass-Coutts</b>    | 7051               | 3310           |              |
|                        |                   | <b>Whitlash-Aden</b>        | 7052               | 3321           |              |
| Montana                | Saskatchewan      | <b>Turner-Climax</b>        | 6014               | 3306           |              |
|                        |                   | <b>Morgan-Monchy</b>        | 6015               | 3319           |              |
|                        |                   | <b>Opheim-West Poplar</b>   | 6013               | 3317           |              |
|                        |                   | <b>Scobey-Coronach</b>      | 6012               | 3309           |              |
|                        |                   | <b>Whitetail-Big Beaver</b> | 6011               | 3312           |              |
|                        |                   | <b>Raymond-Regway</b>       | 6070               | 3301           |              |
| North Dakota           | Saskatchewan      | <b>Fortuna-Oungre</b>       | 6100               | 3417           |              |
|                        |                   | <b>Ambrose-Torquay</b>      | 6103               | 3410           |              |
|                        |                   | <b>Noonan-Estevan</b>       | 6102               | 3420           |              |
|                        |                   | <b>Portal-North Portal</b>  | 6021               | 3403           |              |
|                        |                   | <b>Northgate-Northgate</b>  | 6023               | 3406           |              |
|                        |                   | <b>Sherwood-Carievale</b>   | 6024               | 3414           |              |
| North Dakota           | Manitoba          | <b>Antler-Lyleton</b>       | 5083               | 3413           |              |
|                        |                   | <b>Westhope-Coulter</b>     | 5081               | 3419           |              |
|                        |                   | <b>Carbury-Goodlands</b>    | 5082               | 3421           |              |
|                        |                   | <b>Dunseith-Boissevain</b>  | 5071               | 3422           |              |
|                        |                   | <b>St. John-Lena</b>        | 5073               | 3405           |              |
|                        |                   | <b>Hansboro-Cartwright</b>  | 5072               | 3415           |              |
|                        |                   | <b>Sarles-Crystal City</b>  | 5091               | 3409           |              |
|                        |                   | <b>Hannah-Snowflake</b>     | 5092               | 3408           |              |
|                        |                   | <b>Maida-Windygate</b>      | 5093               | 3416           |              |
|                        |                   | <b>Walhalla-Winkler</b>     | 5031               | 3407           |              |
|                        |                   | <b>Nече-Gretna</b>          | 5030               | 3404           |              |
| <b>Pembina-Emerson</b> | 5021              | 3401                        |                    |                |              |

**LAND PORT NAMES, CANADIAN-U.S. BORDER**—Continued

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

| U.S. state | Canadian province                     | Border crossing  | Canadian port code | U.S. port code                      | Observations                                     |
|------------|---------------------------------------|--|--------------------|-------------------------------------|--|
| Minnesota  | Manitoba                              | <b>Noyes-Emerson East</b>                                      | 5025               | 3402                                |  |
|            |                                       | <b>Pinecreek-Piney</b>   | 5051               | 3425                                |  |
|            |                                       | <b>Roseau-South Junction</b>                                   | 5053               | 3426                                |  |
|            |                                       | <b>Warroad-Sprague</b>   | 5052               | 3423                                |  |
| Minnesota  | Ontario                               | <b>Baudette-Rainy River</b>                                    | 4880               | 3424                                |  |
|            |                                       | <b>International Falls-Ranier-Fort Frances</b>                 | 4780               | 3604                                | Pedestrians                                      |
|            |                                       | <b>Grand Portage-Pigeon River</b>                              | 4751               | 3613                                |  |
| Michigan   | Ontario                               | <b>Sault Ste. Marie-Sault Ste. Marie</b>                       | 4410               | 3803                                |  |
|            |                                       | <b>Port Huron-Sarnia</b>                                       | 4401               | 3802                                | Passenger vehicles/passengers                    |
|            |                                       | <b>Algonac-Walpole Island</b>                                  | 4651               | 3814                                |  |
|            |                                       | <b>Detroit-Windsor</b>   | 4530/4520          | 3801                                |  |
|            |                                       | Ambassador Bridge-Windsor Ambassador Bridge                    | 4530               | 3801                                | Passenger vehicles/buses/passengers              |
|            | Windsor-Detroit Tunnel-Windsor Tunnel | 4520   | 3801               | Passenger vehicles/buses/passengers |  |
| New York   | Ontario                               | <b>Buffalo-Niagara Falls-Fort Erie and Niagara Falls</b>       |                    | 0901                                |  |
|            |                                       | Buffalo-Fort Erie  | 4102/4101          | 0901                                | Passenger vehicles/buses/passengers (commercial) |
|            |                                       | Niagara Falls-Niagara Falls                                    |                    | 0901                                | Passenger vehicles/buses/passengers              |
|            |                                       | Buffalo, Peace Bridge-Fort Erie                                | 4102/4101          | 0901                                | (commercial)                                     |
|            |                                       | Niagara Falls, Rainbow Bridge-Rainbow Bridge                   | 4272               | 0901                                | Passenger vehicles/buses/passengers              |
|            |                                       | Niagara Falls, Whirlpool Rapids Bridge-Whirlpool Rapids Bridge | 4271/4275          | 0901                                | Passenger vehicles/buses/passengers (commercial) |
|            |                                       | Lewiston Bridge-Queenston Bridge                               | 4273               | 0901                                | Passenger vehicles/buses/passengers              |
|            |                                       | <b>Cape Vincent-Point Alexandria</b>                           |                    | 0706                                |  |
|            |                                       | <b>Alexandria Bay-Lansdowne</b>                                | 4560               | 0708                                |  |
|            |                                       | Ogdensburg-Prescott  | 4390               | 0701                                |  |

**LAND PORT NAMES, CANADIAN-U.S. BORDER**—Continued

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

| U.S. state | Canadian province | Border crossing  | Canadian port code | U.S. port code | Observations  |
|------------|-------------------|--|--------------------|----------------|---------------|
| New York   | Ontario/Québec    | <b>Massena-Cornwall</b>  | 4090               | 0704           |               |
| New York   | Québec            | <b>Fort Covington-Dundee</b>   | 3300               | 0705           |               |
|            |                   | <b>Trout River-Trout River and Jamieson</b>                                |                    | 0715           |               |
|            |                   | Trout River-Trout River  | 3520               | 0715           |               |
|            |                   | Trout River-Jamieson   | 3720               | 0715           |               |
|            |                   | <b>Châteaugay-Herdman</b>  | 3020               | 0711           |               |
|            |                   | <b>Champlain-Rouses Point-Lacolle Routes (15, 221, 223) and Covey Hill</b> |                    | 0712           |               |
|            |                   | Champlain-Rouses Point-Lacolle (Route 15)                                  | 3513               | 0712           |               |
|            |                   | Champlain-Rouses Point-Lacolle (Route 221)                                 | 3512               | 0712           |               |
|            |                   | Champlain-Rouses Point-Lacolle (Route 223)                                 | 3511               | 0712           |               |
|            |                   | Champlain-Rouses Point-Covey Hill  | 3332               | 0712           |               |
| Vermont    | Québec            | <b>Highgate Springs-Alburg-Phillipsburg-Noyan</b>                          | 3370               | 0212           |               |
|            |                   | <b>Richford-Abercorn and East Pinnacle</b>                                 | 0203               |                |               |
|            |                   | Richford-Abercorn  | 3180               | 0203           |               |
|            |                   | Richford-East Pinnacle   | 3690               | 0203           |               |
|            |                   | North Troy-Highwater   | 3340               |                | Rail crossing |
|            |                   | <b>Derby Line-Rock Island (Routes 55 and 143)</b>                          |                    | 0209           |               |
|            |                   | Derby Line-Rock Island (Route 55)  | 3141               | 0209           |               |
|            |                   | Derby Line-Rock Island (Route 143)   | 3142               | 0209           |               |
|            |                   | <b>Norton-Stanhope</b>   | 3540               | 0211           |               |
|            |                   | <b>Beecher Falls-East Hereford</b>   | 3620               | 0206           |               |

**LAND PORT NAMES, CANADIAN-U.S. BORDER**—Continued

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

| <b>U.S. state</b> | <b>Canadian province</b> | <b>Border crossing</b>   | <b>Canadian port code</b>  | <b>U.S. port code</b>  | <b>Observations</b>                          |
|-------------------|--------------------------|--|--|--|--|
| Maine             | Québec                   | <b>Jackman-Armstrong</b><br>Skinner-Boundary   | 3291   | 0104   | Rail crossing                                |
| Maine             | New Brunswick            | <b>Fort Kent-Clair</b><br><b>Madawaska-Edmundston</b><br><b>Van Buren-St. Leonard</b><br><b>Limestone-Gillespie</b><br><b>Fort Fairfield-Andover</b><br><b>Bridgewater-Centreville</b><br><b>Houlton-Woodstock Road</b><br><b>Vanceboro-St. Croix</b><br><b>Calais-St. Stephen</b> | 2160<br>2130<br>2180<br>2370<br>2140<br>2150<br>2121<br>2310<br>2110 | 0110<br>0109<br>0108<br>0118<br>0107<br>0127<br>0106<br>0105<br>0115 |  |
| Maine             | Nova Scotia              | <b>Portland, Bar Harbour-Yarmouth</b><br>Bar Harbour-Yarmouth<br>Portland-Yarmouth   | 7750<br>7750   | 0101   | Ferry crossing<br>Pedestrians<br>Pedestrians |

## LAND PORT NAMES, MEXICAN-U.S. BORDER

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

| U.S. state | Mexican state   | Border crossing  | U.S. port code | Observations  |
|------------|-----------------|--|----------------|---|
| California | Baja California | <b>San Ysidro-Puerta México (Tijuana)</b>  | 2504           | Passenger vehicles/rail/pedestrian  |
|            |                 | <b>Otay Mesa-Mesa de Otay</b>  | 2506           | Primarily freight   |
|            |                 | <b>Tecate-Tecate</b>   | 2505           | Includes rail   |
|            |                 | <b>Calexico-Mexicali</b><br>Calexico-Mexicali I  | 2503           | Includes rail   |
|            |                 | <b>Calexico East-Nuevo Mexicali</b>  | 2507           | Completed 1997  |
|            |                 | <b>Andrade-Vicente Guerrero</b><br>Andrade-Los Algodones   | 2502           |   |
| Arizona    | Sonora          | <b>San Luis-San Luis Río Colorado</b>  | 2608           |   |
|            |                 | <b>Lukeville-Sonoyta</b>   | 2602           |   |
|            |                 | <b>Sasabe-Sasabe</b>   | 2606           | Also known as La Garita de Landrillera  |
|            |                 | <b>Nogales-Nogales</b><br>Nogales (DDC)-Nogales I<br>Nogales I (Morley Gate)-Nogales II<br>Nogales (Mariposa)-Nogales III        | 2604           | Includes rail<br>Passenger vehicles/pedestrian only   |
|            |                 | <b>Naco-Naco</b>   | 2603           |   |
|            |                 | <b>Douglas-Agua Prieta</b>   | 2601           | Passenger vehicles/freight only   |
| New Mexico | Chihuahua       | <b>Columbus-Gral.</b><br>Rodrigo M. Queredo  | 2406           | Mainly passenger  |
|            |                 | Antelope Wells-El Berrendo   | 2406           | Trade data included in Columbus, NM   |
|            |                 | <b>Santa Teresa-San Jerónimo</b>   | 2408           | Passenger vehicles and freight  |
| Texas      | Chihuahua       | <b>El Paso-Ciudad Juarez</b><br>Paso del Norte (Santa Fe Street)-Puente Benito Juarez<br>Good Neighbor Bridge-Buen Vecino Bridge | 2402           | One-way northbound toll, includes rail<br><br>Also known as Stanton Street Bridge, Friendship Bridge, Puente Río Bravo, Puente Ciudad Juárez-Stanton Lerdo, Puente Lerdo. |

**LAND PORT NAMES, MEXICAN-U.S. BORDER**—Continued

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

| U.S. state | Mexican state  | Border crossing  | U.S. port code                                     | Observations   |
|------------|----------------|--|--|--|
| Texas—Con. | Chihuahua—Con. | Bridge of the Americas-Puente Internacional Córdova-Las Américas       | 2404   | Also known as Puente Río Bravo, Puente Córdova Bridge, Puente Libre, BOTA. Load limits includes rail, no tolls                     |
|            |                | Ysleta-Zaragoza Bridge   |  | Includes rail  |
|            |                | <b>Fabens-Guadalupe Bravos</b><br>Fabens-Caseta-Poctor P. Parra        |  | Also known as Puente la Caseta. Toll (northbound)  |
|            |                | <b>Fort Hancock-El Porvenir</b><br>Fort Hancock-El Porvenir Bridge     |  | Mainly passenger. Trade data included in Fabens, Texas   |
|            |                | <b>Presidio-Ojinaga</b><br>Presidio-Ojinaga Bridge                     | 2403   | Passenger vehicles/pedestrians. Toll (northbound)<br>Includes rail   |
| Texas      | Coahuila       | <b>Del Río-Ciudad Acuña</b><br>La Linda Bridge-Puente la Linda         | 2302   | Also known as Big Bend Crossing Bridge, Heath Crossing. Two-lane facility with little traffic                                      |
|            |                | Del Río, Lake Amistad Dam Crossing-Presa La Amistad                    | 2303   | Also known as Del Río International Bridge, Puente Acuña-Ciudad Del Río.   |
|            |                | Del Río-Ciudad Acuña International Bridge                              |  |  |
|            |                | <b>Eagle Pass-Piedras Negras</b><br>Eagle Pass Bridge-Piedras Negras I |  |  |
|            |                | Eagle Pass Bridge-Piedras Negras II                                    | Passenger vehicles/pedestrians/commercial vehicles |  |
|            |                | Eagle Pass Rail Crossing -Piedras Negras Rail Crossing                 | Rail only  |  |
| Texas      | Nuevo León     | <b>Laredo-Colombia</b><br>Laredo-Colombia Solidarity Bridge            | 2304   | Also known as Laredo III, Colombia Bridge, Puente Solidaridad, Puente Colombia. Passenger vehicles/pedestrians/commercial vehicles |

**LAND PORT NAMES, MEXICAN-U.S. BORDER**—*Continued*

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

| <b>U.S. state</b> | <b>Mexican state</b> | <b>Border crossing</b>                        | <b>U.S. port code</b>  | <b>Observations</b>   |
|-------------------|----------------------|---|--|---|
| Texas             | Tamaulipas           | <b>Laredo-Nuevo Laredo</b>                    | 2304   | Rail only   |
|                   |                      | Laredo-Nuevo Laredo Railroad Crossing         |  | Also known as Convent Street Bridge, Laredo International Bridge, Old Bridge, Laredo-Nuevo Laredo Bridge 1, Puente Nuevo Laredo, Puente Laredo I, Puente Viejo. |
|                   |                      | Gateway to the Americas Bridge-Nuevo Laredo I |  | (Note: Beginning in April 2000, bridges #1 and #2 only service passenger traffic because of the opening of bridge #4, World Trade Bridge.)                      |
|                   |                      | Juarez-Lincoln Bridge-Nuevo Laredo II         |  | Also known as bridge #2, Laredo-Nuevo Laredo Bridge 2, Puente Juárez Lincoln.   |
|                   |                      | Falcon Heights-Nuevo Ciudad Guerrero          | (Note: Beginning in April 2000, bridges #1 and #2 only service passenger traffic because of the opening of bridge #4, World Trade Bridge.) |   |
|                   |                      | Lake Falcon Dam Crossing-Puente San Juan      | Also known as Falcon Dam, Presa Falcon, Puente Internacional de la Presa.  |   |
|                   |                      | World Trade Bridge                            | Primarily passenger vehicles   |   |
|                   |                      | <b>Roma-Ciudad Miguel Alemán</b>              | 2310   | Also known as Starr County International Bridge, Roma Bridge, Puente Roma-Miguel.   |
|                   |                      | <b>Rio Grande City-Ciudad Camargo</b>         | 2307   | Also known as Starr-Camargo Bridge, Puente Camargo.   |
|                   |                      | Rio Grande City-Camargo Bridge                |  | Narrow two-lane bridge. Primarily passenger vehicles  |
|                   |                      | Los Ebanos-Gustavo Díaz Ordaz                 |  | Passenger ferry. The construction of Los Ebanos International Bridge is proposed as an alternative for this ferry.  |

**LAND PORT NAMES, MEXICAN-U.S. BORDER**—Continued

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

| U.S. state  | Mexican state   | Border crossing   | U.S. port code | Observations  |
|---|-----------------|---|----------------|---|
| Texas—Con.  | Tamaulipas—Con. | <b>Hidalgo-Reynosa</b>  | 2305           | Also known as Hidalgo Bridge, Puente Reynosa, Puente Reynosa-McAllen I. Two structures. The old four-lane bridge serves only southbound traffic. The new four-lane bridge serves only northbound traffic. |
|   |                 | Mc Allen-Hidalgo-Reynosa Bridge   |                |   |
|   |                 | Pharr-Reynosa III International Bridge on the Rise  | 2309           | Passenger vehicles/freight  |
|   |                 | <b>Progreso-Nuevo Progreso</b>  |                |   |
|   |                 | Progreso International Bridge-Nuevo Progreso  |                |   |
|   |                 | <b>Brownsville-Matamoros</b>  | 2301           | Also known as Indios-Lucio Blanco Bridge, Puente Lucio Blanco-Los Indios.<br>Also known as Brownsville I & Matamoros Bridge, B Y M, Puente Viejo. Passenger vehicles/freight/includes rail                |
| Free Trade Bridge-Puente Internacional Libre Comercio |                 |   |                |   |
| B&M Bridge  |                 |   |                |   |
| Gateway International Bridge-Puerta México            |                 |   |                |   |
| The Veterans-General Ignacio Zaragoza                 |                 | Also known as El Puente, Puente Nuevo, Brownsville II.<br>Also known as Los Tomates Bridge, Expressway 77 Bridge, and Matamoros III Bridge. |                |   |

## HARMONIZED TARIFF SCHEDULE FOR INTERNATIONAL MERCHANDISE TRADE

| <b>Chapter</b> | <b>Description</b>                          | <b>Chapter</b> | <b>Description</b>                        |
|----------------|---|----------------|---|
| 1              | Live Animals                                | 36             | Explosives                                |
| 2              | Meat and Edible Offal                       | 37             | Photographic Goods                        |
| 3              | Fish and Crustaceans                        | 38             | Miscellaneous Chemical Products           |
| 4              | Dairy Products                              | 39             | Plastics                                  |
| 5              | Products of Animal Origin                   | 40             | Rubber and Articles                       |
| 6              | Live Trees and Plants                       | 41             | Raw Hides and Skins                       |
| 7              | Edible Vegetables and Roots                 | 42             | Articles of Leather and Handbags          |
| 8              | Edible Fruit and Nuts                       | 43             | Furskins and Artificial Fur               |
| 9              | Coffee, Tea and Spices                      | 44             | Wood and Articles                         |
| 10             | Cereals                                     | 45             | Cork and Articles                         |
| 11             | Malts, Starches and Inulin                  | 46             | Straw and Basketware                      |
| 12             | Oil Seeds and Oleaginous Fruits             | 47             | Pulp of Wood and Paperboard               |
| 13             | Lac, Gums, Resins and Saps                  | 48             | Paper and Paperboard                      |
| 14             | Vegetable Plaiting Materials                | 49             | Printed Books                             |
| 15             | Animal or Vegetable Fats and Oils           | 50             | Silk                                      |
| 16             | Preparations of Fish and Meat               | 51             | Wool and Animal Hair                      |
| 17             | Sugars and Sugar Confectionery              | 52             | Cotton                                    |
| 18             | Cocoa and Cocoa Preparations                | 53             | Other Vegetable Fibers and Paper Yarn     |
| 19             | Preparations of Cereals and Flour           | 54             | Man-made Filaments                        |
| 20             | Preparations of Vegetables, Fruits and Nuts | 55             | Man-made Staple Fibers                    |
| 21             | Miscellaneous Edible Preparations           | 56             | Wadding, Felt and Nonwovens               |
| 22             | Beverages, Spirits and Vinegar              | 57             | Carpets and Other Textile Floor Coverings |
| 23             | Food Residues and Waste                     | 58             | Special Woven Fabrics                     |
| 24             | Tobacco and Manufactured Tobacco            | 59             | Impregnated Fabrics                       |
| 25             | Salt, Sulfur, Plaster and Cement            | 60             | Knitted or Crocheted Fabrics              |
| 26             | Ores, Slag and Ash                          | 61             | Knitted or Crocheted Apparel              |
| 27             | Mineral Fuels, Oils and Waxes               | 62             | Not Knitted or Crocheted Apparel          |
| 28             | Inorganic Chemicals                         | 63             | Other Made up Textile Articles            |
| 29             | Organic Chemicals                           | 64             | Footwear                                  |
| 30             | Pharmaceutical Products                     | 65             | Headgear                                  |
| 31             | Fertilizers                                 | 66             | Umbrellas and Walking Sticks              |
| 32             | Tanning or Dyeing Extracts                  | 67             | Feathers and Down                         |
| 33             | Essential Oils and Resinoids                | 68             | Stone, Plaster, Cement and Asbestos       |
| 34             | Soap and Organic Surface-Active Agents      | 69             | Ceramic Products                          |
| 35             | Albuminoidal Substances, Glues and Enzymes  | 70             | Glass                                     |

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| <b>Chapter</b> | <b>Description</b>                             | <b>Chapter</b> | <b>Description</b>                           |
|----------------|--|----------------|--|
| 71             | Pearls, Stones, Metals and Imitation Jewelry   | 86             | Locomotives and Traffic Signals              |
| 72             | Iron and Steel                                 | 87             | Vehicles Other than Railway                  |
| 73             | Articles of Iron and Steel                     | 88             | Aircraft, Spacecraft and Parts               |
| 74             | Copper and Articles                            | 89             | Ships and Boats                              |
| 75             | Nickel and Articles                            | 90             | Measuring and Testing Instruments            |
| 76             | Aluminum and Articles                          | 91             | Clocks, Watches and Parts                    |
| 78             | Lead and Articles                              | 92             | Musical Instruments and Parts                |
| 79             | Zinc and Articles                              | 93             | Arms and Ammunition and Parts                |
| 80             | Tin and Articles                               | 94             | Furniture, Lamps and Prefabricated Buildings |
| 81             | Other Base Metals and Cermets                  | 95             | Toys, Games and Sport Equipment              |
| 82             | Tools of Base Metal                            | 96             | Miscellaneous Manufactured Articles          |
| 83             | Miscellaneous Articles of Base Metals          | 97             | Works of Art and Antiques                    |
| 84             | Nuclear Reactors, Boilers, Machinery and Parts | 98             | Special Classification Provisions            |
| 85             | Electrical Machinery, Equipment and Parts      | 99             | Special Trade Transactions                   |

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a p p e n d i x D

Tables in U.S.  
Measures



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# a p p e n d i x D

## Tables in U.S. Measures

### t a b l e 1-2

#### Area

(Number of square miles)

|                   | Canada           | Mexico         | United States    |
|-------------------|------------------|----------------|------------------|
| <b>Total area</b> | <b>3,849,674</b> | <b>839,145</b> | <b>3,717,813</b> |
| Land area         | 3,558,097        | 756,470        | 3,536,294        |
| Water area        | 291,577          | 82,675         | 181,519          |

#### SOURCES

##### Canada

Natural Resources Canada. GeoAccess Division. (Ottawa, Ont.: 1998).

##### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Geografía. (Aguascalientes, Ags.: 1998).

##### United States

U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States 1998*. (Washington, DC: 1998).

**t a b l e** 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-miles, total (billions)        | N       | <sup>e</sup> 197.0 | N                 | N      | N       | N       | 2,144         | 2,423     | 2,482     |
| Road motor vehicles, total (millions)       | 17.0    | <sup>r</sup> 17.0  | <sup>r</sup> 17.2 | 10.2   | 12.0    | 12.4    | 193.1         | 205.4     | 210.2     |
| <b>Rates per 100 million vehicle-miles</b>  |         |                    |                   |        |         |         |               |           |           |
| Fatality                                    | N       | <sup>e</sup> 1.7   | N                 | N      | N       | N       | 2.1           | 1.7       | 1.7       |
| Injury                                      | N       | 123                | N                 | N      | N       | N       | 151           | 143       | 141       |
| <b>Rates per 10,000 road motor vehicles</b> |         |                    |                   |        |         |         |               |           |           |
| 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. Minister 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).

**t a b l e** 4-1

## Energy Consumption by the Transportation Sector

Quads (quadrillion Btu)

|  | Canada             |             |             | Mexico      |             |             | United States |              |              |
|--|--------------------|-------------|-------------|-------------|-------------|-------------|---------------|--------------|--------------|
|  | 1990               | 1995        | 1996        | 1990        | 1995        | 1996        | 1990          | 1995         | 1996         |
| <b>Energy consumption, total<sup>a</sup></b>                 | <b>7.43</b>        | <b>8.14</b> | <b>8.51</b> | <b>4.89</b> | <b>5.20</b> | <b>5.59</b> | <b>84.12</b>  | <b>90.86</b> | <b>93.87</b> |
| <b>Transportation consumption, total<sup>b</sup></b>         | <b>1.93</b>        | <b>2.15</b> | <b>2.20</b> | <b>1.21</b> | <b>1.33</b> | <b>1.36</b> | <b>22.54</b>  | <b>24.07</b> | <b>24.66</b> |
| Transportation's share of total energy consumption (percent) | 26.0               | 26.4        | 25.9        | 24.8        | 25.5        | 24.4        | 26.8          | 26.5         | 26.3         |
| Fossil fuels, total <sup>c</sup>                             | 1.92               | 2.14        | 2.19        | N           | N           | N           | 22.49         | 24.03        | 24.62        |
| Natural gas  | 0.13               | 0.23        | 0.24        | N           | N           | N           | 0.68          | 0.72         | 0.73         |
| Trillion cubic feet  | 0.12               | 0.22        | 0.23        | N           | N           | N           | 0.66          | 0.70         | 0.71         |
| Petroleum  | 1.79               | 1.91        | 1.95        | 1.20        | 1.33        | 1.36        | 21.81         | 23.31        | 23.89        |
| Million barrels  | 329                | 351         | 359         | 211         | 243         | 249         | 4,004         | 4,281        | 4,385        |
| Electricity <sup>b</sup>                                     | <sup>b</sup> 0.011 | 0.013       | 0.013       | 0.003       | 0.003       | 0.004       | 0.014         | 0.013        | 0.013        |

<sup>a</sup>For all three countries, energy consumption, total **includes** electrical system energy losses.

<sup>b</sup>For all three countries, transportation consumption, total and electricity do **not** include electrical system energy losses.

<sup>c</sup>Coal is not included in this table, because all three countries use negligible amounts of coal for transportation.

**KEY:** N = Data are nonexistent.

### NOTES

#### Canada

Energy consumption, total: Includes renewable energy.

Transportation consumption, total: Includes fuel used in fisheries and in private trucking, but excludes fuel consumption by public administrations.

#### Mexico

Natural gas: Data are nonexistent, but natural gas consumption in Mexico is estimated to be quite small.

#### United States

Energy consumption, total: Includes renewable energy.

Transportation consumption, total: Total is greater than the sum of the components, because electrical system energy losses are not listed. Fisheries are not included, but fuel consumption by public administrations is included.

### SOURCES

#### Canada

Statistics Canada. *Quarterly Report on Energy Supply-Demand in Canada, Catalogue No. 57-003-XPB*. (Ottawa, Ont.: various editions).

#### Mexico

Secretaría de Energía. *Balance Nacional, Energía. 1996*. (Mexico City, D.F.: 1998).

#### United States

U.S. Department of Energy. Energy Information Agency. *Annual Energy Review, 1997* and *Monthly Energy Review, August 1998*. (Washington, DC: 1998).

**t a b l e** 4-2

## Energy Consumption by Mode of Transportation

Trillion Btu (10 to the 12th Btu)

|                            | Canada         |                |                | Mexico         |                |                | United States |               |               |
|----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|---------------|---------------|
|                            | 1990           | 1995           | 1996           | 1990           | 1995           | 1996           | 1990          | 1995          | 1996          |
| <b>Total</b>               | <b>1,931.4</b> | <b>2,150.7</b> | <b>2,203.8</b> | <b>1,208.8</b> | <b>1,326.1</b> | <b>1,360.3</b> | <b>22,540</b> | <b>24,070</b> | <b>24,660</b> |
| <b>Air</b>                 | <b>175.5</b>   | <b>175.4</b>   | <b>195.1</b>   | <b>69.8</b>    | <b>90.4</b>    | <b>88.5</b>    | <b>1,811</b>  | <b>1,836</b>  | <b>1,891</b>  |
| Jet fuel                   | 170.3          | 171.5          | 191.3          | 68.1           | 86.8           | 87.4           | 1,769         | 1,803         | 1,857         |
| Aviation gasoline          | 5.2            | 3.9            | 3.7            | 1.6            | 3.7            | 1.1            | 42            | 33            | 34            |
| <b>Road</b>                | <b>1,416.4</b> | <b>1,546.2</b> | <b>1,574.3</b> | <b>1,087.1</b> | <b>1,188.1</b> | <b>1,221.8</b> | <b>N</b>      | <b>18,268</b> | <b>18,726</b> |
| Gasoline                   | 1,114.6        | 1,150.4        | 1,165.3        | 794.2          | 880.4          | 895.1          | 13,691        | 14,633        | 14,939        |
| Diesel                     | 277.2          | 364.4          | 376.7          | 278.5          | 290.0          | 308.5          | 2,900         | 3,600         | 3,750         |
| Other fuels                | 24.6           | 31.4           | 32.4           | 14.4           | 17.6           | 18.2           | N             | 35            | 37            |
| <b>Pipeline</b>            | <b>135.0</b>   | <b>232.5</b>   | <b>241.2</b>   | <b>U</b>       | <b>U</b>       | <b>U</b>       | <b>680</b>    | <b>722</b>    | <b>734</b>    |
| Natural gas                | 126.1          | 220.7          | 228.9          | U              | U              | U              | 680           | 722           | 734           |
| Electricity                | 8.2            | 10.4           | 10.2           | U              | U              | U              | U             | U             | U             |
| Diesel                     | 0.6            | 1.3            | 2.1            | U              | U              | U              | U             | U             | U             |
| <b>Rail</b>                | <b>84.8</b>    | <b>76.7</b>    | <b>75.0</b>    | <b>25.2</b>    | <b>21.4</b>    | <b>23.4</b>    | <b>444</b>    | <b>493</b>    | <b>507</b>    |
| Distillate/diesel fuel     | 84.8           | 76.7           | 75.0           | 25.2           | 21.4           | 23.4           | 443           | 492           | 506           |
| Freight rail               | 82.6           | 74.7           | 73.0           | U              | U              | U              | 432           | 483           | 496           |
| Intercity passenger        | 2.2            | 2.0            | 2.0            | U              | U              | U              | 11            | 9             | 10            |
| Electricity                |                |                |                |                |                |                |               |               |               |
| Intercity passenger        | NS             | NS             | NS             | U              | U              | U              | 1             | 1             | 1             |
| <b>Transit</b>             | <b>18.0</b>    | <b>23.3</b>    | <b>22.3</b>    | <b>N</b>       | <b>N</b>       | <b>N</b>       | <b>N</b>      | <b>121</b>    | <b>119</b>    |
| Electricity                | 3.0            | 2.8            | 2.9            | 2.6            | 3.3            | 3.4            | 17            | 17            | 17            |
| Motor fuels                |                |                |                |                |                |                |               |               |               |
| Gasoline                   | 0.5            | 0.4            | NS             | N              | N              | N              | 4             | 8             | 8             |
| Diesel                     | 12.1           | 12.7           | 12.0           | N              | N              | N              | 90            | 94            | 92            |
| Compressed natural gas     | 2.5            | 7.4            | 7.4            | N              | N              | N              | N             | 2             | 2             |
| <b>Water transport</b>     | <b>101.7</b>   | <b>96.7</b>    | <b>96.0</b>    | <b>N</b>       | <b>N</b>       | <b>N</b>       | <b>1,396</b>  | <b>1,338</b>  | <b>1,323</b>  |
| Residual fuel oil          | 57.0           | 52.8           | 52.4           | 19.6           | 1.3            | 1.5            | 947           | 881           | 853           |
| Distillate/diesel fuel oil | 44.7           | 43.1           | 43.0           | 4.5            | 21.5           | 21.7           | 286           | 324           | 346           |
| Gasoline                   | NS             | 0.8            | 0.6            | N              | N              | N              | 163           | 133           | 124           |

**KEY:** N = Data are nonexistent. NS = Not significant. U = Data are unavailable.

### NOTES

#### All Countries

Transportation energy consumption: Electrical systems energy losses are excluded from the overall total as well as individual modal totals.

Transit: Canadian and U.S. data refer to **all transit**, including local transit buses and other road transit vehicles, which also are reported under road. Some ferryboats also are included.

#### Mexico

Road, other fuels: Refers to liquified petroleum gas.

Road, gasoline, diesel, other fuels: Includes data on transit, motor fuels, and no breakdown is possible.

Rail, distillate/diesel fuel: Includes passenger and cargo services, and no breakdown is possible.

Transit, motor fuels: Data for subcategories cannot be separately identified for transit. Instead they are included in the fuel categories for road (gasoline, diesel and other fuels).

Water transport, residual fuel oil, distillate/diesel fuel oil: In 1991, vessel fuel usage began to change. Diesel substituted for residual fuel oil.

#### United States

Total: The total differs from the sum of the individual modes for reasons discussed in Appendix B.

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**t a b l e** 4-2**Energy Consumption by Mode of Transportation**—Continued**SOURCES****Canada**

All modes except transit rail: Statistics Canada. *Quarterly Report on Energy Supply-Demand in Canada, Catalogue No. 57-003-XPB*. (Ottawa, Ont.: various quarterly editions).

Natural Resources Canada. *Canada's Energy Outlook 1996-2020*. (Ottawa, Ont.: 1998).

Transit rail: Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue No. 53-215-XPB*. (Ottawa, Ont.: various years).

**Mexico**

Secretaría de Energía. *Balance Nacional, Energía. 1996*. (Mexico City, D.F.: 1998).

Comisión Nacional para el Ahorro de Energía. Private communication. (Mexico City, D.F.: 1998).

**United States**

Total: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review, 1997*. (Washington, DC: 1998).

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. Private Communication. (Washington, DC: 1998).

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Pipeline: U.S. Department of Energy. *Natural Gas Annual 1996*. (Washington, DC: 1997).

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American Public Transit Association. *Transit Fact Book*. (Washington, DC: various years).

American Public Transit Association. Private Communication. (Washington, DC: 1998).

Water transport: U.S. Department of Energy. Energy Information Administration. *Fuel Oil and Kerosene Sales*. (Washington, DC: various years).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997).

**t a b l e** 4-3

## Estimated Consumption of Alternative and Replacement Fuels for Road Motor Vehicles

(Thousand gasoline-equivalent gallons)

|  | Canada            |                   |                   | Mexico   |          |          | United States      |                    |                    |
|--|-------------------|-------------------|-------------------|----------|----------|----------|--------------------|--------------------|--------------------|
|  | 1990              | 1995              | 1996              | 1990     | 1995     | 1996     | 1992 <sup>a3</sup> | 1995               | 1996               |
| <b>Fuel consumption, total<sup>a</sup></b> | <b>11,180,864</b> | <b>12,198,778</b> | <b>12,415,527</b> | <b>N</b> | <b>N</b> | <b>N</b> | <b>134,231,000</b> | <b>144,776,000</b> | <b>148,182,000</b> |
| <b>Alternative fuels, total</b>            | <b>217,776</b>    | <b>311,582</b>    | <b>319,844</b>    | <b>N</b> | <b>N</b> | <b>N</b> | <b>229,631</b>     | <b>277,507</b>     | <b>297,231</b>     |
| Liquefied petroleum gases (LPG)            | 197,664           | 252,244           | 260,277           | N        | N        | N        | 208,142            | 232,701            | 239,158            |
| Compressed natural gas (CNG)               | 20,106            | 59,259            | 59,488            | N        | N        | N        | 16,823             | 35,162             | 46,923             |
| Liquefied natural gas (LNG)                | 0                 | 0                 | 0                 | N        | N        | N        | 585                | 2,759              | 3,247              |
| Methanol, 85 percent (M85)                 | 5                 | 80                | 80                | N        | N        | N        | 1,069              | 2,887              | 3,390              |
| Methanol, neat (M100)                      | 0                 | 0                 | 0                 | N        | N        | N        | 2,547              | 2,150              | 347                |
| Ethanol, 85 percent (E85)                  | 0                 | 0                 | 0                 | N        | N        | N        | 21                 | 190                | 694                |
| Ethanol, 95 percent (E95)                  | 0                 | 0                 | 0                 | N        | N        | N        | 85                 | 995                | 2,699              |
| <b>Electricity</b>                         | <b>NS</b>         | <b>NS</b>         | <b>NS</b>         | <b>N</b> | <b>N</b> | <b>N</b> | <b>359</b>         | <b>663</b>         | <b>773</b>         |
| Oxygenates                                 |                   |                   |                   |          |          |          |                    |                    |                    |
| Methyl tertiary butyl ether (MTBE)         | NS                | NS                | NS                | N        | N        | N        | 1,175,000          | 2,691,200          | 2,749,700          |
| Ethanol in gasohol                         | 2,600             | 10,600            | 10,600            | N        | N        | N        | 701,000            | 910,700            | 660,200            |
| <b>Traditional fuels</b>                   |                   |                   |                   |          |          |          |                    |                    |                    |
| Gasoline                                   | 8,962,970         | 9,250,671         | 9,370,584         | N        | N        | N        | 110,135,000        | 115,943,000        | 117,783,000        |
| Diesel                                     | 1,997,477         | 2,625,957         | 2,714,531         | N        | N        | N        | 23,866,000         | 28,555,040         | 30,101,430         |

<sup>a</sup>U.S. data for 1990 are not available. Nearest data year is 1992.

**KEY:** N = Data are nonexistent. NS = Not significant.

### NOTES

#### Mexico

Alternative fuels, liquefied petroleum gases: In Table 4-2 under road, other fuels, an estimation of fuel consumption in petajoules is shown.

### SOURCES

#### Canada

Natural Resources Canada. Office of Energy Efficiency. (Ottawa, Ont.: 1998).

#### United States

U.S. Department of Energy. Energy Information Administration. *Alternatives to Traditional Transportation Fuels, 1996*. (Washington, DC: 1997).

**t a b l e** 4-4

## Average Price<sup>a</sup> of Fossil Fuel to End-Users

(Current U.S. cents per gallon)

|                           | Canada |       |       | Mexico |       |       | United States |       |       |
|---------------------------|--------|-------|-------|--------|-------|-------|---------------|-------|-------|
|                           | 1990   | 1995  | 1996  | 1990   | 1995  | 1996  | 1990          | 1995  | 1996  |
| <b>Motor vehicle fuel</b> |        |       |       |        |       |       |               |       |       |
| <b>Gasoline</b>           |        |       |       |        |       |       |               |       |       |
| Leaded                    | NA     | NA    | NA    | 95.5   | 127.3 | 139.4 | 114.9         | NA    | NA    |
| Unleaded premium          | 204.4  | 178.7 | 186.8 | NA     | NA    | 158.4 | 134.9         | 133.6 | 141.3 |
| Unleaded regular          | 189.5  | 152.8 | 161.0 | 134.6  | 132.1 | 143.4 | 116.4         | 114.7 | 123.1 |
| Average over all types    |        |       |       |        |       |       |               |       |       |
| Price with taxes          | U      | U     | U     | U      | U     | U     | 121.7         | 120.5 | 128.8 |
| Taxes                     | 74.3   | 73.6  | 75.3  | U      | U     | U     | 24.6          | 36.9  | 37.0  |
| <b>Diesel</b>             |        |       |       |        |       |       |               |       |       |
| Price with taxes          | 163.2  | 116.4 | 119.9 | 81.4   | 96.7  | 106.6 | U             | 110.9 | 123.5 |
| Taxes                     | 58.1   | 46.3  | 46.6  | U      | U     | U     | 31.1          | 43.4  | 43.3  |
| <b>Aviation fuel</b>      |        |       |       |        |       |       |               |       |       |
| Gasoline                  | 159.4  | 118.4 | 119.7 | 134.6  | 132.1 | 143.4 | 112.0         | 100.5 | 111.6 |
| Jet fuel                  | 83.5   | 53.3  | 58.4  | 95.3   | 67.4  | 88.6  | 76.7          | 54.6  | 64.8  |
| <b>Rail fuel</b>          |        |       |       |        |       |       |               |       |       |
| Diesel                    | 89.0   | 59.3  | 64.8  | 81.4   | 96.7  | 106.6 | 69.2          | 60.0  | 67.7  |
| <b>Water transport</b>    |        |       |       |        |       |       |               |       |       |
| Combined fuels            | 54.4   | 38.1  | 43.8  | 30.7   | 24.8  | 49.8  | U             | 38    | 42    |

<sup>a</sup>Unless otherwise stated in the country notes below, prices include the cost of the fuel and taxes. Taxes are given separately in this table only for all types of motor vehicle gasoline and for motor vehicle diesel fuel. See Appendix B for information on fuel taxes in each country.

**KEY:** NA = Not applicable. U = Data are unavailable.

### NOTES

#### Mexico

Data refer to sales price to the public as of December 31 of each year.

#### United States

Motor vehicle fuel taxes: Sales weighted average of federal and state fuel taxes only. Does not include state sales taxes. If these were included, they would raise the average tax in 1996 by roughly half a cent per liter for both gasoline and diesel. Note that the motor vehicle fuel prices do include state sales taxes.

Aviation fuel: Does not include any taxes. Price of jet fuel is that paid by the large certified air carriers, which are defined in Appendix B.

Rail fuel: Price includes federal fuel taxes only; no state taxes are included.

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**t a b l e 4-4****Average Price<sup>a</sup> of Fossil Fuel to End-Users—Continued****SOURCES****Canada**

Natural Resources Canada. Office of Energy Efficiency. (Ottawa, Ont.: 1998).

**Mexico**

Petróleos Mexicanos. PEMEX-Refinación. *Anuario Estadístico, 1998*. (Mexico City, D.F.: 1999).

Petróleos Mexicanos. PEMEX-Refinación. Subgerencia de Planeación (Mexico City, D.F.:1999)

**United States**

Motor vehicle fuel: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review 1997*. (Washington, DC: 1998).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997).

Aviation fuel, gasoline: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review, 1997*. (Washington, DC: 1998).

Aviation fuel, jet fuel: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. Private Communication. (Washington, DC: 1998).

Rail fuel: Association of American Railroads. *Railroad Facts, 1997 Edition*. (Washington, DC: 1997).

Rail fuel taxes: Association of American Railroads. Private Communication. (Washington, DC: 1998).

Water transport: U.S. Department of Transportation. Maritime Administration (MARAD). Private Communication. (Washington, DC: 1998).

table 4-5

## New Model Year Fuel Efficiency for Road Motor Vehicles

(Gallons per 100 miles)

|                               | Canada     |            |            | Mexico |            |            | United States |            |            |
|-------------------------------|------------|------------|------------|--------|------------|------------|---------------|------------|------------|
|                               | 1990       | 1995       | 1996       | 1990   | 1995       | 1996       | 1990          | 1995       | 1996       |
| <b>Sales weighted average</b> |            |            |            |        |            |            |               |            |            |
| Passenger cars                | 3.5        | 3.4        | 3.4        | 3.9    | 3.4        | 3.3        | 3.6           | 3.5        | 3.5        |
| Light trucks                  | 4.8        | 4.9        | 4.8        | U      | U          | U          | 4.8           | 4.9        | 4.8        |
| <b>Range</b>                  |            |            |            |        |            |            |               |            |            |
| Passenger cars                | 8.8 to 2.1 | 8.2 to 2.1 | 7.6 to 2.1 | U      | 3.9 to 2.9 | 4.6 to 2.7 | 11.5 to 1.5   | 9.7 to 1.7 | 7.2 to 1.8 |
| Light trucks                  | 9.5 to 2.9 | 8.0 to 3.6 | 7.7 to 3.6 | U      | U          | U          | 8.4 to 3.0    | 6.8 to 3.0 | 7.1 to 3.2 |

**KEY:** U = Data are unavailable.**NOTES****All Countries**

Sales weighted average: Assumes 55 percent city and 45 percent highway travel.

Light trucks: Gross vehicle weight rating of zero kg to 3,856 kg (i.e., 8,500 pounds or less).

Averages and ranges: United States and Canada include both domestic and imported vehicles. Mexico includes only domestic vehicles.

**SOURCES****Canada**Sales weighted average: Transport Canada. *Transportation in Canada, 1997 - Annual Report, TP 13198*. (Ottawa, Ont.: 1998).Ranges: Natural Resources Canada. *Canada's Energy Outlook, 1996-2020*. (Ottawa, Ont.: 1997).Transport Canada and Natural Resources Canada. *Fuel Consumption Guide, Annual*. (Ottawa, Ont.: various years).**Mexico**

Secretaría de Energía. Comisión Nacional para el Ahorro de Energía, Dirección de Transporte. (Mexico City, D.F.: 1998).

**United States**

Sales weighted average: U.S. Department of Transportation. National Highway Traffic Safety Administration. Consumer Programs Division, NPS-32. (Washington, DC: 1998).

Ranges: U.S. Department of Transportation. National Highway Traffic Safety Administration. Automotive Fuel Economy Program. *Twenty-second Annual Report to Congress*. (Washington, DC: various years).

U.S. Department of Transportation. National Highway Traffic Safety Administration. Consumer Programs Division, NPS-32. Private Communication. (Washington, DC: 1998).

**t a b l e** 4-6a

## Federal Emission Control Requirements for Passenger Cars and Light Trucks: Model Year

(Grams of emissions per mile)

|  | Total hydrocarbons | Nonmethane hydrocarbons | Carbon monoxide (CO) | Cold temperature CO | Nitrogen oxides | Particulates      |
|--|--------------------|-------------------------|----------------------|---------------------|-----------------|-------------------|
| <b>Canada, 1996</b>                              |                    |                         |                      |                     |                 |                   |
| Passenger cars                                   | 0.41               | NA                      | 3.4                  | NA                  | 1.0             | <sup>a</sup> 0.20 |
| Light trucks                                     |                    |                         |                      |                     |                 |                   |
| Under 3,751 pounds (loaded vehicle weight)       | 0.80               | NA                      | 10                   | NA                  | 1.2             | <sup>a</sup> 0.26 |
| Over 3,750 pounds (loaded vehicle weight)        | 0.80               | NA                      | 10                   | NA                  | 1.7             | <sup>a</sup> 0.13 |
| <b>Mexico, model years 1995 and later</b>        |                    |                         |                      |                     |                 |                   |
| Passenger cars                                   | 0.41               | NA                      | 3.4                  | NA                  | 1.0             | NA                |
| Light trucks                                     | 1.01               | NA                      | 14.1                 | NA                  | 2.3             | NA                |
| Under 8,503 pounds (gross vehicle weight)        |                    |                         |                      |                     |                 |                   |
| <b>United States, model years 1994 and later</b> |                    |                         |                      |                     |                 |                   |
| Passenger cars                                   |                    |                         |                      |                     |                 |                   |
| Intermediate useful life                         | 0.41               | 0.25                    | 3.4                  | 10.0                | 0.4             | 0.08              |
| Full useful life                                 | NA                 | 0.31                    | 4.2                  | NA                  | 0.6             | 0.10              |
| Light trucks                                     |                    |                         |                      |                     |                 |                   |
| 3,751 to 5,750 pounds (loaded vehicle weight)    |                    |                         |                      |                     |                 |                   |
| Intermediate useful life                         | NA                 | 0.32                    | 4.4                  | 10.0                | 0.7             | <sup>b</sup> 0.08 |
| Full useful life                                 | 0.80               | 0.40                    | 5.5                  | NA                  | 0.97            | <sup>b</sup> 0.10 |

<sup>a</sup>Applies to diesel-fueled vehicles only.

<sup>b</sup>Phase-in begins with model-year 1995.

**KEY:** NA = Not applicable.

### NOTES

#### All Countries

Light trucks are vehicles of about 3,856 kg or less gross vehicle weight rating (GVWR). For the United States and Canada, the exact definition is 8,500 pounds or less, and, for the time period of this table, there are four and two categories of light trucks, respectively, within the range of zero through 8,500 pounds.

#### Canada

Loaded vehicle weight (LVW): See Appendix B under the United States for definition.

From September 1, 1997, Canadian standards are harmonized with U.S. standards by regulation, for all classes of on-road vehicles.

Passenger cars and light trucks: For cars (light-duty vehicles) and light trucks (light-duty trucks, LDT), Canadian 1996 regulated standards were technically equivalent to those of the United States for 1988 model year vehicles, but in practice, manufacturers and importers provided vehicles meeting U.S. 1996 standards.

#### Mexico

Particulates: No regulations are in effect for particulates for these vehicles.

#### United States

Useful life: The life over which the standards must be met. See Appendix B for a more complete definition.

Coverage: This table is a simplification of the U.S. emissions standards for passenger cars and light trucks.

Implementation schedules: Schedules are summarized in Appendix B. The standards were phased in over several years.

Passenger cars and light trucks: Data are for gasoline fueled vehicles only. See Appendix B for the differences for diesel fueled vehicles.

Light trucks: There are four categories of light trucks. The regulations presented here are for the LDT2 category, which has a GVWR up to 2,722 kg (i.e., 6,000 pounds or less) and a LVW of 1,701 kg to 2,608 kg (i.e., 3,751 pounds through 5,750 pounds). (GVWR and LVR are defined in Appendix B.) In 1996, LDT2s accounted for more than 60 percent of the sales of new light trucks.

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**t a b l e** 4-6a**Federal Emission Control Requirements for Passenger Cars and Light Trucks: Model Year**—*Continued***SOURCES****Canada**

Transport Canada. Road Safety and Motor Vehicle Regulations Directorate. (Ottawa, Ont.: 1998).

**Mexico**

Instituto Nacional de Ecología. *Diario Oficial de la Federación. Norma Oficial Mexicana NOM-042-ECOL-1993.* (Mexico City, D.F.: 1993).

**United States**

*U.S. Code of Federal Regulations.* (Washington, DC: 1998).

U.S. Environmental Protection Agency. Office of Air and Radiation. *Mobile Source Emissions Standards Summary.* (Washington, DC: 1992).

U.S. Environmental Protection Agency. Office of Air and Radiation. Office of Mobile Sources, Vehicle Programs and Compliance Division. *Tier 2 Study White Paper.* (Washington, DC: 1997).

**t a b l e** 5-1

## Domestic Freight Activity by Mode

(Millions of U.S. short tons)

|                                  | Canada       |              |              | Mexico       |              |              | United States  |                |                |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|----------------|----------------|
|                                  | 1990         | 1995         | 1996         | 1990         | 1995         | 1996         | 1990           | 1995           | 1996           |
| <b>Total</b>                     | <b>687.1</b> | <b>784.6</b> | <b>809.8</b> | <b>419.0</b> | <b>473.2</b> | <b>490.8</b> | <b>6,701.3</b> | <b>7,784.5</b> | <b>8,069.7</b> |
| <b>Air</b>                       | <b>0.4</b>   | <b>0.4</b>   | <b>0.4</b>   | <b>0.1</b>   | <b>0.1</b>   | <b>0.1</b>   | <b>8.5</b>     | <b>9.4</b>     | <b>10.7</b>    |
| <b>Water transport</b>           | <b>66.6</b>  | <b>55.7</b>  | <b>53.8</b>  | <b>33.7</b>  | <b>35.1</b>  | <b>34.8</b>  | <b>1,117.8</b> | <b>1,086.2</b> | <b>1,093.3</b> |
| Coastal shipping                 | 28.9         | 24.9         | 23.3         | 33.7         | 35.1         | 34.8         | 298.6          | 266.6          | 267.4          |
| Great Lakes                      | 11.7         | 8.5          | 9.7          | NA           | NA           | NA           | 110.2          | 116.1          | 114.9          |
| Inland waterways <sup>a</sup>    | 26.0         | 22.3         | 20.8         | NA           | NA           | NA           | 709.0          | 703.4          | 711.1          |
| <b>Pipeline</b>                  | <b>244.1</b> | <b>320.3</b> | <b>334.6</b> | <b>U</b>     | <b>U</b>     | <b>U</b>     | <b>1,561.1</b> | <b>1,710.3</b> | <b>1,776.7</b> |
| Crude oil and petroleum products | 160.7        | 192.4        | 202.2        | U            | U            | U            | 1,057.0        | 1,121.0        | 1,177.0        |
| Natural gas                      | 83.3         | 128.0        | 132.4        | U            | U            | U            | 504.1          | 589.3          | 599.7          |
| <b>Rail</b>                      | <b>211.4</b> | <b>224.8</b> | <b>220.5</b> | <b>38.3</b>  | <b>33.8</b>  | <b>33.3</b>  | <b>1,424.9</b> | <b>1,549.6</b> | <b>1,610.9</b> |
| <b>Road</b>                      | <b>164.6</b> | <b>184.4</b> | <b>200.5</b> | <b>346.9</b> | <b>404.2</b> | <b>422.5</b> | <b>2,589.0</b> | <b>3,429.0</b> | <b>3,578.0</b> |

<sup>a</sup>Commercially navigable.

**KEY:** NA = Not applicable. U = Data are unavailable.

### NOTES

#### Canada

Road: Includes *only* activity of Canadian domiciled for-hire carriers with annual intercity revenues greater than or equal to 1 million Canadian dollars; excludes local (less than 24 kilometers) deliveries and deliveries made by private trucks and small for-hire carriers.

Pipeline: Data are for both oil pipelines and natural gas.

#### Mexico

Total: Does not include data for pipelines because the data are unavailable.

Road: Includes only intercity truck activity on the Mexican federal highway system.

#### United States

Road: Data are for intercity for-hire and private truck only.

Pipeline: Data are for both oil pipelines and natural gas.

### SOURCES

#### Canada

Air: Statistics Canada. *Canadian Civil Aviation, Catalogue No. 51-206-XPB*. (Ottawa, Ont.: various years).

Coastal shipping, Great Lakes and inland waterways and rail: Transport Canada. Economic Analysis Directorate based on Statistics Canada data. (Ottawa, Ont.: 1998).

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue No. 55-201-XPB*, and *Gas Utilities Transport and Distribution Systems, Catalogue No. 57-205-XPB*. (Ottawa, Ont.: various years).

Rail: Transport Canada. Economic Analysis Directorate, based on Statistics Canada data. (Ottawa, Ont.: 1998).

Road: Statistics Canada. *Trucking in Canada, Catalogue No. 53-222-XPB*. (Ottawa, Ont.: various years).

#### Mexico

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras 1990-1996*. (Mexico City, D.F.: 1998).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Rail: Secretaría de Comunicaciones y Transportes. Based on data from Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 y 1996*. (Mexico City, D.F.: various years).

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1998).

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**t a b l e 5-1****Domestic Freight Activity by Mode—Continued****United States**

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: various years).

Coastal shipping, Great Lakes and inland waterways: U.S. Army Corps of Engineers. *Waterborne Commerce of the U.S., Part 5*. (New Orleans, LA: Annual issues).

Pipeline, crude oil and petroleum products: Association of Oil Pipe Lines. *Shifts in Petroleum Transportation*. (Washington, DC: various years).

Pipeline, natural gas: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation based on Department of Energy data. (Washington, DC: 1999).

Rail: Association of American Railroads. *Railroad Facts, 1997*. (Washington, DC: 1997).

Road: Eno Transportation Foundation, Inc. *Transportation in America, 1997*. (Lansdowne, VA: 1997).

**t a b l e 5-2**

# Domestic Freight Activity by Mode

(Billions (thousand millions) of ton-miles)

|                                  | Canada       |              |              | Mexico       |              |              | United States  |                |                |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|----------------|----------------|
|                                  | 1990         | 1995         | 1996         | 1990         | 1995         | 1996         | 1990           | 1995           | 1996           |
| <b>Total</b>                     | <b>356.6</b> | <b>412.9</b> | <b>420.8</b> | <b>105.5</b> | <b>141.1</b> | <b>145.7</b> | <b>3,472.6</b> | <b>3,962.2</b> | <b>4,052.3</b> |
| <b>Air</b>                       | <b>0.3</b>   | <b>0.4</b>   | <b>0.4</b>   | <b>0.6</b>   | <b>0.8</b>   | <b>0.7</b>   | <b>7.4</b>     | <b>10.7</b>    | <b>10.9</b>    |
| <b>Water transport</b>           | <b>36.8</b>  | <b>29.1</b>  | <b>27.5</b>  | <b>13.2</b>  | <b>13.7</b>  | <b>13.6</b>  | <b>833.5</b>   | <b>807.7</b>   | <b>764.7</b>   |
| Coastal shipping                 | 9.6          | 6.8          | 7.1          | 13.2         | 13.7         | 13.6         | 479.1          | 440.3          | 408.1          |
| Great Lakes                      | 5.0          | 3.5          | 3.7          | NA           | NA           | NA           | 60.9           | 59.7           | 58.3           |
| Inland waterways <sup>a</sup>    | 22.2         | 18.4         | 16.8         | NA           | NA           | NA           | 293.5          | 307.7          | 298.3          |
| <b>Pipeline</b>                  | <b>145.3</b> | <b>187.6</b> | <b>192.2</b> | <b>U</b>     | <b>U</b>     | <b>U</b>     | <b>862.7</b>   | <b>917.1</b>   | <b>934.7</b>   |
| Crude oil and petroleum products | 70.4         | 71.2         | 71.9         | U            | U            | U            | 584.1          | 601.1          | 619.2          |
| Natural gas                      | 74.9         | 116.4        | 120.3        | U            | U            | U            | 278.6          | 316.0          | 315.5          |
| <b>Rail</b>                      | <b>136.7</b> | <b>150.7</b> | <b>151.6</b> | <b>17.1</b>  | <b>15.1</b>  | <b>14.4</b>  | <b>1,034.0</b> | <b>1,305.7</b> | <b>1,356.0</b> |
| <b>Road</b>                      | <b>37.5</b>  | <b>45.1</b>  | <b>49.0</b>  | <b>74.6</b>  | <b>111.5</b> | <b>117.0</b> | <b>735.0</b>   | <b>921.0</b>   | <b>986.0</b>   |

<sup>a</sup>Commercially navigable.

**KEY:** NA = Not applicable. U = Data are unavailable.

**NOTES**
**Canada**

Road: Data include only activity of Canadian domiciled for-hire carriers with annual intercity revenues greater than or equal to 1 million Canadian dollars. Data exclude local (less than 24 kilometers) deliveries, and deliveries made by private trucks and small for-hire carriers. Pipeline: Data are for both oil pipelines and natural gas.

**Mexico**

Total: Does not include data for pipelines because the data are unavailable.

Road: Includes only intercity truck activity on the Mexican federal highway system.

**United States**

Pipeline: Data are for both oil pipelines and natural gas.

Road: Data are for intercity for-hire and private truck only.

**SOURCES**
**Canada**

Air: Statistics Canada. *Canadian Civil Aviation, Catalogue No. 51-206-XPB*. (Ottawa, Ont.: various years).

Coastal shipping, Great Lakes and inland waterways and rail: Transport Canada. Economic Analysis Directorate based on Statistics Canada data. (Ottawa, Ont.: 1998).

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue No. 55-201-XPB*, and *Gas Utilities Transport and Distribution Systems, Catalogue No. 57-205-XPB*. (Ottawa, Ont.: various years).

Rail: Transport Canada. Economic Analysis Directorate, based on Statistics Canada data. (Ottawa, Ont.: 1998).

Road: Statistics Canada. *Trucking in Canada, Catalogue No. 53-222-XPB*. (Ottawa, Ont.: various years).

**Mexico**

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras 1990-1996*. (Mexico City, D.F.: 1998).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Rail: Secretaría de Comunicaciones y Transportes. Based on data from Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 y 1996*. (Mexico City, D.F.: various years).

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1998).

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**t a b l e** 5-2**Domestic Freight Activity by Mode**—*Continued***United States**

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: various years).

Coastal shipping, Great Lakes and inland waterways: U.S. Army Corps of Engineers. *Waterborne Commerce of the U.S., Part 5*. (New Orleans, LA: Annual issues).

Pipeline, crude oil and petroleum products: Association of Oil Pipe Lines. *Shifts in Petroleum Transportation*. (Washington, DC: various years).

Pipeline, natural gas: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation based on Department of Energy data. (Washington, DC: 1999).

Rail: Association of American Railroads. *Railroad Facts, 1997*. (Washington, DC: 1997).

Road: Eno Transportation Foundation, Inc. *Transportation in America, 1997*. (Lansdowne, VA: 1997).

**t a b l e** 5-3a

## Top Canadian Domestic Freight Commodities by Mode: 1996

(Millions of U.S. short tons)

| Mode of transportation        | Total | Mode of transportation         | Total |
|-------------------------------|-------|--------------------------------|-------|
| <b>Air</b>                    |       | <b>Road</b>                    |       |
| N                             | N     | Forest products                | 44.4  |
|                               |       | Live animals and food products | 26.5  |
| <b>Pipeline</b>               |       | Petroleum products             | 25.5  |
| Natural gas                   | 132.4 | Construction materials         | 20.3  |
| Crude oil                     | 131.1 | Steel                          | 15.8  |
| Petroleum products            | 71.1  | <b>Water transport</b>         |       |
|                               |       | Iron ore                       | 7.8   |
| <b>Rail</b>                   |       | Pulpwood and chips             | 7.4   |
| Bituminous coal               | 43.9  | Wheat                          | 5.3   |
| Iron ore and concentrates     | 41.2  | Stone and limestone            | 5.1   |
| Wheat                         | 22.4  | Fuel oil                       | 4.8   |
| Muriate of potassium (potash) | 13.5  | <b>Intermodal</b>              |       |
| Pulpwood and chips            | 12.9  | N                              | N     |

**KEY:** N = Data are nonexistent.**SOURCES**

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue No. 55-201-XPB, 1996.* (Ottawa, Ont.: 1997). Statistics Canada. *Gas Utilities, Transport and Distribution Systems, Catalogue No. 57-205-XPB, 1996.* (Ottawa, Ont.: 1997).

Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB, 1996.* (Ottawa, Ont.: 1998).

Road: Statistics Canada. Transportation Division. Special for-hire trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada's Marine Database.)

**t a b l e** 5-3b

## Top Mexican Domestic Freight Commodities by Mode: 1996

(Millions of U.S. short tons)

| Mode of transportation | Total | Mode of transportation              | Total |
|------------------------|-------|-------------------------------------|-------|
| <b>Air</b>             |       | <b>Road</b>                         |       |
| N                      | N     | Miscellaneous manufactured articles | 56.4  |
|                        |       | Salt, sulfur, plaster and cement    | 39.7  |
| <b>Pipeline</b>        |       | Mineral fuels, oils and waxes       | 31.9  |
| Crude oil              | U     | Edible fruits and vegetables        | 21.9  |
| Natural gas            | U     | Beverages, spirits and vinegar      | 20.5  |
| Petroleum products     | U     | <b>Water transport</b>              |       |
|                        |       | Crude oil and petroleum products    | 21.4  |
| <b>Rail</b>            |       | Limestone                           | 8.0   |
| Cement                 | 10.3  | Salt                                | 6.9   |
| Corn                   | 6.5   | Iron ore pellets                    | 1.5   |
| Iron ore               | 4.3   | Cement                              | 0.1   |
| Coal                   | 3.1   | <b>Intermodal</b>                   |       |
| Fuel oil               | 2.6   | N                                   | N     |

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

### NOTES

Road and water transport: Data are for 1993.

Road and rail: Data include foreign trade merchandise.

### SOURCES

Rail: Secretaría de Comunicaciones y Transportes. Based on data from the Ferrocarriles Nacionales de México. *Series Estadísticas, 1996*. (Mexico City, D.F.: 1997).

Road: Instituto Mexicano del Transporte based on the vehicle's weight and dimensions study. (Sanfandila, Qro.: 1997).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

**t a b l e** 5-3c

## Top U.S. Domestic Freight Commodities by Mode: 1993

(Millions of U.S. short tons)

| Mode of transportation  | Total   | Mode of transportation                        | Total   |
|---|---------|---|---------|
| <b>Air</b>  |         | <b>Road</b>                                   |         |
| Machinery, excluding electricals                                  | 0.51    | Nonmetallic minerals                          | 1,504.2 |
| Chemicals or allied products                                      | 0.36    | Petroleum or coal products                    | 992.7   |
| Electrical machinery, equipment or supplies                       | 0.28    | Food or kindred products                      | 743.2   |
| Transportation equipment  | 0.26    | Lumber or wood products, excluding furniture  | 583.1   |
| Instruments, photographic and optical goods,<br>watches or clocks | 0.10    | Chemicals or allied products                  | 310.5   |
|   |         | <b>Water transport</b>                        |         |
| <b>Pipeline</b>   |         | Petroleum and petroleum products              | 930.6   |
| Crude oil   | 1,019.6 | Crude materials                               | 360.6   |
| Petroleum products  | 850.9   | Coal  | 300.4   |
| Natural gas   | 554.0   | Food and farm products                        | 269.3   |
|   |         | Chemicals and related products                | 131.6   |
| <b>Rail</b>   |         | <b>Intermodal (road and rail combination)</b> |         |
| Coal  | 631.1   | Transportation equipment                      | 7.6     |
| Farm products   | 174.9   | Chemicals or allied products                  | 2.1     |
| Nonmetallic minerals  | 144.9   | Food or kindred products                      | 1.9     |
| Petroleum or coal products  | 136.2   | Lumber or wood products, excluding furniture  | 1.7     |
| Chemicals or allied products                                      | 130.3   | Pulp, paper or allied products                | 1.6     |

### SOURCES

Air, road and rail: U.S. Department of Commerce. U.S. Census Bureau. *1993 Commodity Flow Survey*. Special tabulation. (Washington, DC: 1998).

Pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation. (Washington, DC: 1998).

Water transport: U.S. Army Corps of Engineers (USACE). *Waterborne Commerce of the United States, Calendar Year 1996; Part 5 - National Summaries*. (New Orleans, LA: 1997).

**t a b l e** 5-4a

## Top Canadian Domestic Freight Interprovincial Pairs by Mode: 1996

(Thousands of U.S. short tons)

| Mode of transportation           | Total  | Mode of transportation       | Total |
|----------------------------------|--------|------------------------------|-------|
| <b>Air</b>                       |        | Québec to Ontario            | 7,545 |
| N                                | N      | Alberta to British Columbia  | 3,360 |
|                                  |        | British Columbia to Alberta  | 2,270 |
| <b>Pipeline</b>                  |        | Alberta to Saskatchewan      | 1,963 |
| N                                | N      |                              |       |
| <b>Rail</b>                      |        | <b>Water transport</b>       |       |
| Alberta to British Columbia      | 32,336 | Ontario to Québec            | 6,820 |
| Newfoundland to Québec           | 23,011 | Québec to Ontario            | 6,573 |
| Saskatchewan to British Columbia | 14,209 | Nova Scotia to Newfoundland  | 893   |
| Saskatchewan to Ontario          | 9,093  | Nova Scotia to Québec        | 821   |
| Ontario to Québec                | 5,155  | Nova Scotia to New Brunswick | 750   |
| <b>Road</b>                      |        | <b>Intermodal</b>            |       |
| Ontario to Québec                | 7,719  | N                            | N     |

**KEY:** N = Data are nonexistent.

**NOTE:** Data represent one-way flows.

**SOURCES**

Rail: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Rail data adapted by Transport Canada from Statistics Canada sources.)

Road: Statistics Canada. Transportation Division. Special for-hire trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada's Marine Database.)

**t a b l e** 5-4b

## Top U.S. Domestic Freight Interstate Pairs by Mode: 1993

(Thousands of U.S. short tons)

| Mode of transportation    | Total  | Mode of transportation             | Total  |
|---------------------------|--------|------------------------------------|--------|
| <b>Air</b>                |        | Illinois to Indiana                | 19,850 |
| California to Texas       | 43     | Pennsylvania to New Jersey         | 18,729 |
| California to New Jersey  | 30     | Michigan to Ohio                   | 16,596 |
| Indiana to California     | 24     | New Jersey to New York             | 16,079 |
| New Jersey to California  | 18     | <b>Water transport</b>             |        |
| California to Georgia     | 17     | Illinois to Louisiana              | 20,300 |
| <b>Pipeline</b>           |        | Missouri to Louisiana              | 12,222 |
| N                         | N      | West Virginia to Pennsylvania      | 12,057 |
| <b>Rail</b>               |        | Louisiana to Texas                 | 9,731  |
| Wyoming to Texas          | 41,456 | Iowa to Louisiana                  | 9,511  |
| West Virginia to Virginia | 23,854 | <b>Intermodal</b>                  |        |
| Wyoming to Kansas         | 21,464 | <b>(road and rail combination)</b> |        |
| Wyoming to Missouri       | 20,400 | Kentucky to Michigan               | 1,089  |
| Illinois to Indiana       | 18,960 | California to Michigan             | 345    |
| <b>Road</b>               |        | Ohio to California                 | 328    |
| Indiana to Illinois       | 28,636 | Illinois to California             | 288    |
|                           |        | Michigan to Florida                | 180    |

**KEY:** N = Data are nonexistent.

**NOTE:** Data represent one-way flows.

**SOURCE:** U.S. Department of Commerce. U.S. Census Bureau. *1993 Commodity Flow Survey*. Special tabulation. (Washington, DC: 1998).

**t a b l e** 5-5a

## Top Canadian Domestic Freight Area Pairs by Mode: 1996

(Thousands of U.S. short tons)

| Mode of transportation          | Total | Mode of transportation                                     | Total |
|---------------------------------|-------|--|-------|
| <b>Air</b>                      |       | Toronto, Ont. to Hamilton, Ont.                            | 1,063 |
| N                               | N     | Montréal, Que. to Québec, Que.                             | 1,013 |
| <b>Pipeline</b>                 |       | <b>Water transport</b>                                     |       |
| N                               | N     | Sept-Îles/Pte-Noire, Que. to Hamilton, Ont.                | 3,631 |
|                                 |       | Havre-St-Pierre, Que. to Sorel, Que.                       | 2,697 |
| <b>Rail</b>                     |       | Port-Cartier, Que. to Hamilton, Ont.                       | 2,277 |
| N                               | N     | Colborne, Ont. to Clarkson, Ont.                           | 2,010 |
| <b>Road</b>                     |       | Fraser River, B.C. to East Coast<br>Vancouver Island, B.C. | 1,791 |
| Hamilton, Ont. to Toronto, Ont. | 2,994 | <b>Intermodal</b>  |       |
| Toronto, Ont. to Montréal, Que. | 2,272 | N  | N     |
| Montréal, Que. to Toronto, Ont. | 1,789 |  |       |

**KEY:** N = Data are nonexistent.

**NOTES:** Data represent one-way flows.

Water data represent port to port pairs rather than metropolitan area pairs.

**SOURCES:** Road: Statistics Canada. Transportation Division. Special for-hire trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada's Marine Database.)

**t a b l e** 5-5b

## Top Mexican Domestic Freight Area Pairs by Mode: 1996

(Thousands of U.S. short tons)

| Mode of transportation                    | Total | Mode of transportation                         | Total  |
|---|-------|--|--------|
| <b>Air</b>                                |       | <b>Road</b>                                    |        |
| Mexico City, D.F. to Guadalajara, Jal.    | 7     | Mexico City, D.F. to Nuevo Laredo, Tamps.      | 14,000 |
| Mexico City, D.F. to Tijuana, B.C.        | 6     | Mexico City, D.F. to Monterrey, N.L.           | 8,200  |
| Mexico City, D.F. to Cancún, Q. Roo.      | 4     | Mexico City, D.F. to Guadalajara, Jal.         | 6,700  |
| Guadalajara, Jal. to México City, D.F.    | 4     | Mexico City, D.F. to Veracruz, Ver.            | 5,200  |
| Mexico City, D.F. to Monterrey, N.L.      | 4     | Mexico City, D.F. to Toluca, Edo. de Mex.      | 4,900  |
| <b>Pipeline</b>                           |       | <b>Water transport</b>                         |        |
| U   | U     | Guerrero Negro, B.C.S. to Isla de Cedros, B.C. | 8,200  |
| <b>Rail</b>                               |       | Pajaritos, Ver. to Tuxpan, Ver.                | 4,400  |
| Nuevo Laredo, Tamps. to Monterrey, N.L.   | 1,712 | Salina Cruz, Oax. to Guaymas, Son.             | 2,500  |
| Nuevo Laredo, Tamps. to Mexico City, D.F. | 1,401 | Salina Cruz, Oax. to Manzanillo, Col.          | 2,300  |
| Veracruz, Ver. to Mexico City, D.F.       | 885   | Salina Cruz, Oax. to Lázaro Cárdenas, Mich.    | 1,400  |
| Ciudad Sahagún, Hgo. to Mexico City, D.F. | 863   | <b>Intermodal</b>                              |        |
| Nuevo Laredo, Tamps. to Guadalajara, Jal. | 768   | N  | N      |

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

### NOTES

Data represent one-way flows.

Rail: Figures of 1993, based on allocation studies (see Appendix B).

Road: Figures of 1994, from a survey of motor carrier vehicles on federal roads (see Appendix B).

Water transport: Data represent port to port pairs rather than metropolitan area pairs.

### SOURCES

Air: Instituto Mexicano del Transporte based on special tabulations of the Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Sanfandila, Qro.: 1999).

Rail: Instituto Mexicano del Transporte. *Evaluación Económica de Mejoras a la Infraestructura del Sistema Nacional Ferroviario, Publicación Técnica No. 82*. Estimates included in this document are based on information from the Ferrocarriles Nacionales de México. (Sanfandila, Qro.: 1996).

Road: Instituto Mexicano del Transporte. Special tabulation from *Estudio de pesos y dimensiones de los vehiculos de carga que circulan en la red nacional de carreteras, 1994*. (Sanfandila, Qro.: 1999).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

**t a b l e** 6-2a

## Canadian Merchandise Trade With Mexico and the United States by Mode of Transportation

(Thousands of U.S. short tons)

|   | 1990 <sup>e</sup> | 1995 <sup>e</sup> | 1996 <sup>e</sup> |
|---|-------------------|-------------------|-------------------|
| <b>Total trade with Mexico</b>            | <b>2,264</b>      | <b>5,074</b>      | <b>5,147</b>      |
| Air                                       | 31                | 81                | 50                |
| Water transport                           | 1,437             | 2,765             | 2,863             |
| Road                                      | 459               | 1,046             | 856               |
| Rail                                      | 320               | 487               | 413               |
| Pipeline and other <sup>a</sup>           | 17                | 715               | 964               |
| <b>Exports to Mexico</b>                  | <b>762</b>        | <b>2,459</b>      | <b>2,408</b>      |
| Air                                       | 7                 | 26                | 5                 |
| Water transport                           | 506               | 2,086             | 2,146             |
| Road                                      | 86                | 159               | 87                |
| Rail                                      | 164               | 188               | 170               |
| Pipeline and other <sup>a</sup>           | NS                | NS                | NS                |
| <b>Imports from Mexico</b>                | <b>1,501</b>      | <b>2,635</b>      | <b>2,739</b>      |
| Air                                       | 24                | 55                | 45                |
| Water transport                           | 933               | 680               | 717               |
| Road                                      | 373               | 887               | 769               |
| Rail                                      | 155               | 299               | 243               |
| Pipeline and other <sup>a</sup>           | 17                | 715               | 964               |
| <b>Total trade with the United States</b> | <b>270,960</b>    | <b>390,600</b>    | <b>405,635</b>    |
| Air                                       | 2,995             | 2,710             | 2,622             |
| Water transport                           | 74,839            | 79,912            | 85,286            |
| Road                                      | 73,979            | 105,215           | 108,166           |
| Rail                                      | 45,137            | 66,499            | 67,497            |
| Pipeline and other <sup>a</sup>           | 74,011            | 136,264           | 142,065           |
| <b>Exports to the United States</b>       | <b>193,589</b>    | <b>295,955</b>    | <b>305,922</b>    |
| Air                                       | 198               | 460               | 226               |
| Water transport                           | 44,144            | 49,890            | 53,368            |
| Road                                      | 42,374            | 57,253            | 59,861            |
| Rail                                      | 35,584            | 53,267            | 54,603            |
| Pipeline and other <sup>a</sup>           | 71,288            | 135,084           | 137,861           |
| <b>Imports from the United States</b>     | <b>77,372</b>     | <b>94,645</b>     | <b>99,717</b>     |
| Air                                       | 2,797             | 2,250             | 2,396             |
| Water transport                           | 30,695            | 30,022            | 31,919            |
| Road                                      | 31,604            | 47,962            | 48,304            |
| Rail                                      | 9,554             | 13,232            | 12,894            |
| Pipeline and other <sup>a</sup>           | 2,722             | 1,179             | 4,204             |

<sup>a</sup>Mostly pipeline moves; also includes mail, parcel post and other miscellaneous modes of transportation.**KEY:** e = Data are estimated. NS = Not significant.**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**t a b l e** 6-2b

## Mexican Merchandise Trade With Canada and the United States by Mode of Transportation

(Thousands of U.S. short tons)

|   | 1990            | 1995                | 1996     |
|---|-----------------|---------------------|----------|
| <b>Total trade with Canada</b>            | <b>N</b>        | <b>N</b>            | <b>N</b> |
| Air                                       | <sup>a</sup> 2  | 2                   | 2        |
| Water transport                           | 1,571           | <sup>b</sup> 3,778  | 3,095    |
| Road                                      | N               | N                   | N        |
| Rail                                      | U               | U                   | U        |
| Pipeline                                  | NA              | NA                  | NA       |
| <b>Exports to Canada</b>                  | <b>N</b>        | <b>N</b>            | <b>N</b> |
| Air                                       | <sup>a</sup> 1  | 1                   | 1        |
| Water transport                           | 1,159           | <sup>b</sup> 1,893  | 1,089    |
| Road                                      | N               | N                   | N        |
| Rail                                      | U               | U                   | U        |
| Pipeline                                  | NA              | NA                  | NA       |
| <b>Imports from Canada</b>                | <b>N</b>        | <b>N</b>            | <b>N</b> |
| Air                                       | <sup>a</sup> 1  | 1                   | 1        |
| Water transport                           | 412             | <sup>b</sup> 1,885  | 2,006    |
| Road                                      | N               | N                   | N        |
| Rail                                      | U               | U                   | U        |
| Pipeline                                  | NA              | NA                  | NA       |
| <b>Total trade with the United States</b> | <b>N</b>        | <b>N</b>            | <b>N</b> |
| Air                                       | <sup>a</sup> 77 | 128                 | 155      |
| Water transport                           | 65,334          | <sup>b</sup> 79,888 | 99,100   |
| Road                                      | N               | N                   | 42,690   |
| Rail                                      | U               | U                   | 16,667   |
| Pipeline                                  | U               | U                   | U        |
| <b>Exports to the United States</b>       | <b>N</b>        | <b>N</b>            | <b>N</b> |
| Air                                       | <sup>a</sup> 33 | 66                  | 82       |
| Water transport                           | 54,784          | <sup>b</sup> 68,010 | 85,592   |
| Road                                      | N               | N                   | 15,964   |
| Rail                                      | U               | U                   | 5,305    |
| Pipeline                                  | U               | U                   | U        |
| <b>Imports from the United States</b>     | <b>N</b>        | <b>N</b>            | <b>N</b> |
| Air                                       | <sup>a</sup> 44 | 62                  | 74       |
| Water transport                           | 10,550          | <sup>b</sup> 11,877 | 13,508   |
| Road                                      | N               | N                   | 26,727   |
| Rail                                      | U               | U                   | 11,362   |
| Pipeline                                  | U               | U                   | U        |

<sup>a</sup>Data for 1990 are nonexistent. Data in this table represent 1992.<sup>b</sup>Data for 1995 are nonexistent. Data in this table represent 1994.**KEY:** N = Data are nonexistent. NA = Not applicable. U = Data are unavailable.

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**t a b l e** 6-2b**Mexican Merchandise Trade With Canada and the United States by Mode of Transportation—Continued****SOURCES**

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. Special tabulation. (Mexico City, D.F.: 1997).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1998).

Road and rail, 1996: Instituto Mexicano del Transporte. Special tabulations based on data from the Secretaría de Comercio y Fomento Industrial and U.S. Bureau of Transportation Statistics. (Querétaro, Qro.: 1998).

## U.S. Merchandise Trade With Canada and Mexico by Mode of Transportation

(Thousands of U.S. short tons)

|                                | 1990     | 1995     | 1996     |
|--------------------------------|----------|----------|----------|
| <b>Total trade with Canada</b> | <b>N</b> | <b>N</b> | <b>N</b> |
| Air                            | 245      | 278      | 297      |
| Water transport                | 72,143   | 75,518   | 79,381   |
| Road                           | N        | N        | N        |
| Rail                           | N        | N        | N        |
| Pipeline                       | N        | N        | N        |
| <b>Exports to Canada</b>       | <b>N</b> | <b>N</b> | <b>N</b> |
| Air                            | 188      | 237      | 248      |
| Water transport                | 27,772   | 28,353   | 27,454   |
| Road                           | N        | N        | N        |
| Rail                           | N        | N        | N        |
| Pipeline                       | N        | N        | N        |
| <b>Imports from Canada</b>     | <b>N</b> | <b>N</b> | <b>N</b> |
| Air                            | 56       | 42       | 49       |
| Water transport                | 44,371   | 47,166   | 51,928   |
| Road                           | N        | 59,044   | 63,719   |
| Rail                           | N        | 51,004   | 53,809   |
| Pipeline                       | N        | 67,665   | 69,323   |
| <b>Total trade with Mexico</b> | <b>N</b> | <b>N</b> | <b>N</b> |
| Air                            | 49       | 71       | 91       |
| Water transport                | 57,475   | 79,753   | 83,710   |
| Road                           | N        | N        | N        |
| Rail                           | N        | N        | N        |
| Pipeline                       | N        | N        | N        |
| <b>Exports to Mexico</b>       | <b>N</b> | <b>N</b> | <b>N</b> |
| Air                            | 29       | 31       | 41       |
| Water transport                | 9,449    | 9,515    | 14,437   |
| Road                           | N        | N        | N        |
| Rail                           | N        | N        | N        |
| Pipeline                       | N        | N        | N        |
| <b>Imports from Mexico</b>     | <b>N</b> | <b>N</b> | <b>N</b> |
| Air                            | 20       | 40       | 51       |
| Water transport                | 47,525   | 70,238   | 70,375   |
| Road                           | N        | N        | 15,964   |
| Rail                           | N        | N        | 5,307    |
| Pipeline                       | N        | N        | 125      |

**KEY:** N = Data are nonexistent.

### NOTES

Imports from Canada: The U.S. Customs Service began to require shipping weight for U.S. imports from Canada by all modes of transportation in 1990. However, it did not become possible to disaggregate the land modes (road, rail and pipeline) until 1994.

Imports from Mexico: The U.S. Customs Service began to require shipping weight for U.S. imports from Mexico by land modes of transportation (road, rail and pipeline) in April 1995.

Road, rail and pipeline exports: For 1990, 1995 and 1996, the U.S. Census Bureau did not require shippers to report weight for export shipments to Canada or Mexico for these modes of transportation.

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**t a b l e** 6-2c

## U.S. Merchandise Trade With Canada and Mexico by Mode of Transportation

### SOURCES

Total trade: U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States*. (Washington, DC: 1990, 1995 and 1996).

Air and water: U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *FT920 U.S. Merchandise Trade*. (Washington, DC: December 1990, 1995 and 1996).

Road, rail and pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

**t a b l e** 6-4a

## Top Mexican Maritime Intransit Shipment Ports:<sup>a</sup> January-June 1997

(Thousands of U.S. dollars or U.S. short tons)

|  | Value    | Weight       |
|--|----------|--------------|
| <b>To/from the United States</b>   |          |              |
| <b>U.S. overseas exports transshipped through Mexican maritime ports</b>     | <b>N</b> | <b>23.8</b>  |
| Port of Manzanillo, Col.   | N        | 17.3         |
| Port of Veracruz, Ver.   | N        | 6.0          |
| Port of Lázaro Cárdenas, Mich.   | N        | 0.3          |
| Port of Progreso, Yuc.   | N        | 0.2          |
| Port of Ensenada, B.C.   | N        | 0.1          |
| <b>U.S. overseas imports transshipped through Mexican maritime ports</b>     | <b>N</b> | <b>101.9</b> |
| Port of Tampico, Tamps.  | N        | 55.8         |
| Port of Tuxpan, Ver.   | N        | 25.2         |
| Port of Veracruz, Ver.   | N        | 11.2         |
| Port of Manzanillo, Col.   | N        | 5.1          |
| Port of Altamira, Tamps.   | N        | 4.6          |
| <b>To/from Canada</b>  |          |              |
| <b>Canadian overseas exports transshipped through Mexican maritime ports</b> | <b>N</b> | <b>0</b>     |
| <b>Canadian overseas imports transshipped through Mexican maritime ports</b> | <b>N</b> | <b>0</b>     |

<sup>a</sup>Ports are ranked on total intransit shipment weight.

**KEY:** N = Data are nonexistent.

**NOTE:** Data are unavailable for 1996.

**SOURCE:** Instituto Mexicano del Transporte. Special tabulation based on 1997 data from the Journal of Commerce. *Port Import Export Reporting Service (PIERS)*. (Querétaro, Qro.: 1998).

**t a b l e 6-4b**
**Top U.S. Maritime Intransit Shipment Ports:<sup>a</sup> 1996**

(Thousands of U.S. dollars or U.S. short tons)

|   | Value          | Weight         |
|---|----------------|----------------|
| <b>To/from Canada</b>   |                |                |
| <b>Canadian overseas exports transshipped through U.S. maritime ports</b> | <b>199,519</b> | <b>80.6</b>    |
| Port of Los Angeles, CA   | 119,143        | 33.6           |
| Port of Long Beach, CA  | 70,791         | 42.2           |
| Port of Norfolk, VA   | 4,964          | 2.5            |
| Port of New York, NY  | 1,111          | 1.0            |
| Port of Houston, TX   | 822            | 0.4            |
| <b>Canadian overseas imports transshipped through U.S. maritime ports</b> | <b>442,627</b> | <b>92.9</b>    |
| Port of Superior, WI  | 132,496        | 1.8            |
| Port of Los Angeles, CA   | 83,079         | 12.6           |
| Port of Duluth, MN  | 55,096         | 0.7            |
| Port of Brownsville, TX   | 44,438         | 31.3           |
| Port of Seattle, WA   | 37,781         | 9.1            |
| <b>To/from Mexico</b>   |                |                |
| <b>Mexican overseas exports transshipped through U.S. maritime ports</b>  | <b>420,320</b> | <b>1,224.8</b> |
| Port of Long Beach, CA  | 171,012        | 23.9           |
| Port of Brownsville, TX   | 90,559         | 58.8           |
| Port of Los Angeles, CA   | 46,716         | 14.9           |
| Port of Charleston, SC  | 39,688         | 6.0            |
| Port of Houston, TX   | 21,969         | 4.6            |
| <b>Mexican overseas imports transshipped through U.S. maritime ports</b>  | <b>584,373</b> | <b>1,225.4</b> |
| Port of Los Angeles, CA   | 161,817        | 48.9           |
| Port of Long Beach, CA  | 133,015        | 50.7           |
| Port of Portland, ME  | 126,073        | 980.6          |
| Port Everglades, FL   | 34,136         | 2.1            |
| Port of Miami, FL   | 30,612         | 3.3            |

<sup>a</sup>Ports are ranked on total intransit shipment value.

**SOURCE:** U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. *Annual Waterborne Databanks 1996* (formerly TA 305/705). (Washington, DC: 1998).

**t a b l e** 7-2

## International Merchandise Trade Between North America and the Rest of the World by Weight

(Millions of U.S. short tons)

|  | Canada            |                   |                   | Mexico   |            |             | United States |              |              |
|--|-------------------|-------------------|-------------------|----------|------------|-------------|---------------|--------------|--------------|
|  | 1990 <sup>e</sup> | 1995 <sup>e</sup> | 1996 <sup>e</sup> | 1990     | 1995       | 1996        | 1990          | 1995         | 1996         |
| <b>Total trade</b>                     | <b>263.5</b>      | <b>241.1</b>      | <b>259.8</b>      | <b>U</b> | <b>U</b>   | <b>U</b>    | <b>831.0</b>  | <b>911.6</b> | <b>906.1</b> |
| Exports                                | 197.9             | 169.6             | 188.7             | U        | U          | U           | 374.1         | 406.4        | 384.4        |
| Imports                                | 65.6              | 71.3              | 71.2              | U        | U          | U           | 456.9         | 505.2        | 521.7        |
| <b>Air, total trade</b>                | <b>0.8</b>        | <b>2.0</b>        | <b>1.2</b>        | <b>U</b> | <b>U</b>   | <b>U</b>    | <b>3.2</b>    | <b>4.7</b>   | <b>5.1</b>   |
| Exports                                | 0.2               | 0.6               | 0.3               | U        | U          | U           | 1.4           | 2.2          | 2.4          |
| Imports                                | 0.6               | 1.4               | 0.9               | U        | U          | U           | 1.8           | 2.5          | 2.6          |
| <b>Water, total trade</b>              | <b>242.2</b>      | <b>223.1</b>      | <b>242.7</b>      | <b>U</b> | <b>U</b>   | <b>44.8</b> | <b>827.8</b>  | <b>906.9</b> | <b>901.0</b> |
| Exports                                | 196.1             | 166.9             | 186.4             | U        | U          | 34.5        | 372.7         | 404.2        | 382.0        |
| Imports                                | 46.1              | 56.3              | 56.3              | U        | U          | 10.3        | 455.1         | 502.7        | 519.1        |
| <b>Road, total trade</b>               | <b>5.5</b>        | <b>6.8</b>        | <b>5.0</b>        | <b>U</b> | <b>U</b>   | <b>U</b>    | <b>U</b>      | <b>U</b>     | <b>U</b>     |
| Exports                                | 1.3               | 2.0               | 1.7               | U        | U          | U           | U             | U            | U            |
| Imports                                | 4.2               | 4.7               | 3.3               | U        | U          | U           | U             | U            | U            |
| <b>Rail, total trade</b>               | <b>1.3</b>        | <b>0.9</b>        | <b>0.7</b>        | <b>U</b> | <b>0.2</b> | <b>0.4</b>  | <b>U</b>      | <b>U</b>     | <b>U</b>     |
| Exports                                | 0.2               | 0.3               | 0.2               | U        | 0.2        | 0.4         | U             | U            | U            |
| Imports                                | 1.1               | 0.6               | 0.4               | U        | NS         | NS          | U             | U            | U            |
| <b>Pipeline and other, total trade</b> | <b>13.7</b>       | <b>8.3</b>        | <b>10.1</b>       | <b>N</b> | <b>N</b>   | <b>N</b>    | <b>U</b>      | <b>U</b>     | <b>U</b>     |
| Exports                                | 0.0               | NS                | NS                | N        | N          | N           | U             | U            | U            |
| Imports                                | 13.7              | 8.3               | 10.1              | N        | N          | N           | U             | U            | U            |

**KEY:** e = Data are estimated. N = Data are nonexistent. NS = Not significant. U = Data are unavailable.

### NOTES

#### All Countries

Intra-North American trade is excluded from these figures (e.g., Canada's trade with Mexico and the United States is excluded; Mexico's trade with Canada and the United States is excluded; and the United State's trade with Mexico and Canada is excluded).

#### Canada

All land modes: Canada export data for all land modes represent transshipments (e.g., trade shipments between Canada and a third country that were transhipped via the United States). Canadian import data are based on the last mode of transport by which the cargo was transported to the port of clearance in Canada.

#### Mexico

Total, air and road: Data were not available that excluded trade with Canada and the United States. See Appendix B for available data for Mexican air and road trade with all countries.

Rail: Represents trade with Central American countries. Data were unavailable for 1990 that excluded trade with Canada and the United States. See Appendix B for Mexican rail trade with all countries.

Water: Data were unavailable for 1990 and 1995 that excluded trade with Canada and the United States. See Appendix B for Mexican water trade with all countries.

#### United States

Total: Includes only air and water shipments.

Road, rail and pipeline: Data for these modes are included in U.S. trade with Canada and U.S. trade with Mexico. Data for these modes are therefore shown in Table 6-6.

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**t a b l e 7-2****International Merchandise Trade Between North America  
and the Rest of the World by Weight—Continued****SOURCES****Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**Mexico**

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras, 1989-1995*. (Mexico City, D.F.: 1996).

Water: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Road: Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte, 1997*. (Querétaro, Qro.: 1998).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 y 1996*. (Mexico City, D.F.: various years).

**United States**

Air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996*. (Washington, DC: 1998).

**t a b l e** 7-5a

## Top Canadian International Trade Commodities by Weight: 1996 (Excluding Trade With the United States and Mexico)

(Thousands of U.S. short tons)

|   | 1996   |   | 1996   |
|---|--------|---|--------|
| <b>Overall exports</b>                              |        | <b>Land exports (road only)</b>                     |        |
| Special transactions-trade (99)                     | 66,977 | Ores, slag and ash (26)                             | 330    |
| Mineral fuels, oils and waxes (27)                  | 38,313 | Paper and paperboard (48)                           | 170    |
| Ores, slag and ash (26)                             | 21,608 | Edible vegetables and roots (07)                    | 111    |
| Cereals (10)  | 19,882 | Vehicles other than railway (87)                    | 101    |
| Pulp of wood and paperboard (47)                    | 6,775  | Other made up textile articles (63)                 | 77     |
| <b>Overall imports</b>                              |        | <b>Land imports (road only)</b>                     |        |
| Mineral fuels, oils and waxes (27)                  | 42,279 | Edible fruit and nuts (08)                          | 647    |
| Special transactions-trade (99)                     | 4,490  | Nuclear reactors, boilers, machinery and parts (84) | 370    |
| Ores, slag and ash (26)                             | 3,833  | Special classification provisions (98)              | 284    |
| Inorganic chemicals (28)                            | 3,245  | Iron and steel (72)                                 | 256    |
| Iron and steel (72)                                 | 2,792  | Toys, games and sporting equipment (95)             | 227    |
| <b>Air exports</b>                                  |        | <b>Water exports</b>                                |        |
| Iron and steel (72)                                 | 68     | Special transactions-trade (99)                     | 66,849 |
| Special transactions-trade (99)                     | 64     | Mineral fuels, oils and waxes (27)                  | 38,304 |
| Nuclear reactors, boilers, machinery and parts (84) | 39     | Ores, slag and ash (26)                             | 21,278 |
| Electrical machinery, equipment and parts (85)      | 35     | Cereals (10)  | 19,849 |
| Fish and crustaceans (03)                           | 16     | Pulp of wood and paperboard (47)                    | 6,710  |
| <b>Air imports</b>                                  |        | <b>Water imports</b>                                |        |
| Nuclear reactors, boilers, machinery and parts (84) | 125    | Mineral fuels, oils and waxes (27)                  | 32,015 |
| Special classification provisions (98)              | 116    | Special transactions-trade (99)                     | 4,413  |
| Live trees and plants (06)                          | 113    | Ores, slag and ash (26)                             | 3,619  |
| Electrical machinery, equipment and parts (85)      | 93     | Inorganic chemicals (28)                            | 3,218  |
| Ores, slag and ash (26)                             | 60     | Iron and steel (72)                                 | 2,533  |

### NOTES

Merchandise trade with the United States and Mexico is excluded from these data.

Commodity code: Description based on the two-digit Harmonized Commodity Description and Coding System (HS).

All land modes: Canada export data for all land modes represent transshipments (e.g., trade shipments between Canada and a third country that were transhipped via the United States). Canadian import data are based on the last mode of transport by which the cargo was transported to the port of clearance in Canada.

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**t a b l e** 7-5b

# Top U.S. International Trade Commodities by Weight: 1996 (Excluding Trade With Canada and Mexico)

(Thousands of U.S. short tons)

|   | 1996 |  | 1996    |
|---|------|--|---------|
| <b>Overall exports</b>                              |      | Electrical machinery, equipment and parts (85) | 346     |
| Mineral fuels, oils and waxes (27)                  | 126  | Not knitted or crocheted apparel (62)          | 219     |
| Cereals (10)  | 89   | Live trees and plants (6)                      | 200     |
| Oil seeds and oleaginous fruits(12)                 | 28   | Knitted or crocheted apparel (61)              | 157     |
| Wood and articles (44)                              | 23   |  |         |
| Food residues and waste (23)                        | 15   | <b>Land exports</b>                            |         |
| <b>Overall imports</b>                              |      | U  | U       |
| Mineral fuels, oils and waxes (27)                  | 353  | <b>Land imports</b>                            |         |
| Iron and steel (72)                                 | 25   | U  | U       |
| Ores, slag and ash (26)                             | 25   | <b>Water exports</b>                           |         |
| Salt, sulfur, plaster and cement (25)               | 22   | Mineral fuels, oils and waxes (27)             | 125,180 |
| Inorganic chemicals (28)                            | 10   | Cereals (10)                                   | 88,851  |
| <b>Air exports</b>                                  |      | Oil seeds and oleaginous fruits (12)           | 27,813  |
| Nuclear reactors, boilers, machinery and parts (84) | 548  | Wood and articles (44)                         | 23,597  |
| Electrical machinery, equipment and parts (85)      | 364  | Food residues and waste (23)                   | 15,549  |
| Measuring and testing instruments (90)              | 140  | <b>Water imports</b>                           |         |
| Vehicles other than railway (87)                    | 88   | Mineral fuels, oils and waxes (27)             | 353,118 |
| Plastics (39)                                       | 82   | Iron and steel (72)                            | 25,831  |
| <b>Air imports</b>                                  |      | Ores, slag and ash (26)                        | 24,919  |
| Nuclear reactors, boilers, machinery and parts (84) | 479  | Salt, sulfur, plaster and cement (25)          | 22,155  |
|   |      | Inorganic chemicals (28)                       | 10,201  |

**KEY:** U = Data are unavailable.

**NOTES:** Merchandise trade with Canada and Mexico is excluded from these data.

Commodity code: Description based on the two-digit Harmonized Commodity Description and Coding System (HS).

Total: Includes air and water shipments, excluding trade with Canada and Mexico.

Land (road and rail): Data for these modes are included in U.S. trade with Canada and U.S trade with Mexico for 1996.

**SOURCES:** Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996.* (Washington, DC: 1998).

**t a b l e 8-1**

## Domestic Passenger Travel by Mode

(Billions (or thousand millions) of passenger-miles)

|                               | Canada          |                  |                 | Mexico             |                    |                    | United States |                   |       |
|-------------------------------|-----------------|------------------|-----------------|--------------------|--------------------|--------------------|---------------|-------------------|-------|
|                               | 1990            | 1995             | 1996            | 1990               | 1995               | 1996               | 1990          | <sup>r</sup> 1995 | 1996  |
| <b>Passenger-miles, total</b> | N               | <sup>e</sup> 325 | N               | N                  | N                  | N                  | 3,543         | 4,130             | 4,252 |
| <b>Air</b>                    | N               | N                | N               | 6.0                | 8.6                | <sup>e</sup> 8.1   | 359           | 414               | 445   |
| Air carriers                  | <sup>r</sup> 16 | <sup>r</sup> 16  | <sup>r</sup> 17 | 6.0                | 8.6                | <sup>e</sup> 8.1   | 346           | 404               | 435   |
| <b>Road</b>                   | N               | <sup>e</sup> 309 | N               | N                  | N                  | N                  | 3,159         | 3,690             | 3,779 |
| Personal vehicles             | N               | <sup>e</sup> 290 | N               | N                  | N                  | N                  | 3,037         | 3,554             | 3,641 |
| Passenger cars                | N               | <sup>e</sup> 229 | N               | N                  | N                  | N                  | 2,129         | 2,287             | 2,334 |
| Motorcycles                   | N               | <sup>e</sup> 1   | N               | N                  | N                  | N                  | 12            | 11                | 11    |
| Light trucks                  | N               | <sup>e</sup> 60  | N               | N                  | N                  | N                  | 896           | 1,256             | 1,296 |
| Bus                           | N               | <sup>e</sup> 19  | N               | N                  | N                  | N                  | 121           | 136               | 139   |
| Charter                       | N               | <sup>e</sup> 2   | N               | N                  | N                  | N                  | N             | N                 | N     |
| Intercity                     | N               | <sup>e</sup> 2   | N               | <sup>e</sup> 168.7 | <sup>e</sup> 238.0 | <sup>e</sup> 242.6 | N             | N                 | N     |
| Local motor                   | N               | <sup>e</sup> 8   | N               | N                  | N                  | N                  | 21            | 19                | 19    |
| School                        | N               | <sup>e</sup> 8   | N               | N                  | N                  | N                  | N             | N                 | N     |
| <b>Rail</b>                   |                 |                  |                 |                    |                    |                    |               |                   |       |
| Intercity passenger           | 0.9             | 0.9              | 0.9             | 3.3                | 1.2                | 1.1                | 6             | 6                 | 5     |
| <b>Transit</b>                | N               | <sup>a</sup>     | N               | N                  | N                  | N                  | 41            | 40                | 41    |
| Transit rail                  | N               | N                | N               | N                  | N                  | N                  | 19            | 20                | 21    |
| <b>Water transport</b>        | N               | N                | N               | 0.12               | 0.12               | 0.12               | N             | N                 | N     |

<sup>a</sup>Data for all transit services for 1995 are included in the estimate for local motor bus, under road. The transit rail portion of transit services cannot be broken out.

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

### NOTES

#### All Countries

**Air:** The U.S. total for air represents both air carriers and general aviation. However, only the large certificated air carriers are included. See Appendix B for a more complete explanation. The Mexican air total represents only scheduled air carriers. However, nonscheduled and general aviation represent a very small share of passenger travel in Mexico. Canadian data for total air activity are nonexistent because data for general aviation are not collected.

**Road:** Data do not include passenger travel by commercial freight vehicles.

**Transit and water transport:** For the United States, ferry activity is included in the total for transit. For Mexico, data for overall transit activity are nonexistent because the data are not collected. However, Mexican data for water transport do represent ferry activity. Canadian data for transit overall and ferry activity are nonexistent because the data are not collected.

#### Canada

**Air carriers:** Includes level I to III Canadian air carriers. For a definition of these, see Appendix B.

#### Mexico

**Air:** Data for general aviation are not included in the air total.

**Intercity bus:** Data refer to intercity buses utilizing Mexico's federal highway system.

#### United States

**Passenger-miles, total:** Is not the sum of the subcategories because local motor bus is included in both the road and transit totals. This double counting has been removed from the overall total.

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**t a b l e 8-1****Domestic Passenger Travel by Mode—Continued****SOURCES****Canada**

Air carriers: Statistics Canada. *Canadian Civil Aviation, Catalogue No. 51-206-XPB*. (Ottawa, Ont.: various years).

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

Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB*. (Ottawa, Ont.: various years).

**Mexico**

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

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1997).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas, 1990, 1995 y 1996*. (Mexico City, D.F.: various years).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1998).

**United States**

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: 1986-1997).

U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation 1996*. Web site: [www.bts.gov](http://www.bts.gov)

Road: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997).

American Public Transit Association (APTA). *Transit Fact Book*. (Washington, DC: various years).

Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996).

Transit rail: American Public Transit Association. *Transit Fact Book*. (Washington, DC: various years).

**t a b l e 11-1**

# Domestic Physical System Extent

(Miles)

|                                     | Canada         |                |                | Mexico         |                |                | United States    |                  |                  |
|-------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|
|                                     | 1990           | 1995           | 1996           | 1990           | 1995           | 1996           | 1990             | 1995             | 1996             |
| <b>Road</b>                         | <b>552,336</b> | <b>560,417</b> | <b>U</b>       | <b>148,654</b> | <b>191,372</b> | <b>194,055</b> | <b>3,880,000</b> | <b>3,912,000</b> | <b>3,934,000</b> |
| Paved                               | 184,803        | 197,546        | U              | 52,149         | 59,988         | 61,618         | 2,259,000        | 2,373,000        | 2,380,000        |
| Major road system                   | N              | N              | N              | 50,652         | 57,652         | 58,973         | 407,000          | 430,000          | 433,000          |
| Less than four lanes                | N              | N              | N              | 47,221         | 52,054         | 53,032         | 280,000          | 291,000          | 292,000          |
| Four or more lanes                  | 9,641          | 10,297         | U              | 3,431          | 5,599          | 5,942          | 128,000          | 139,000          | 141,000          |
| Local                               | N              | N              | N              | N              | N              | N              | 1,852,000        | 1,942,000        | 1,947,000        |
| Unpaved                             | 367,533        | 362,871        | U              | 96,505         | 131,384        | 132,437        | 1,621,000        | 1,539,000        | 1,554,000        |
| <b>Great Lakes</b>                  | <b>1,654</b>   | <b>1,654</b>   | <b>1,654</b>   | <b>NA</b>      | <b>NA</b>      | <b>NA</b>      | <b>4,400</b>     | <b>4,400</b>     | <b>4,400</b>     |
| <b>Inland waterways<sup>a</sup></b> | <b>1,755</b>   | <b>1,755</b>   | <b>1,755</b>   | <b>NA</b>      | <b>NA</b>      | <b>NA</b>      | <b>26,000</b>    | <b>26,000</b>    | <b>26,000</b>    |
| <b>Pipeline</b>                     | <b>170,349</b> | <b>192,484</b> | <b>195,188</b> | <b>11,187</b>  | <b>9,703</b>   | <b>9,649</b>   | <b>1,415,646</b> | <b>1,462,652</b> | <b>1,469,534</b> |
| Gas                                 | 148,556        | 169,554        | 172,223        | 8,049          | 7,118          | 7,050          | 1,206,894        | 1,262,152        | 1,269,034        |
| Oil                                 | 21,794         | 22,929         | 22,965         | 3,137          | 2,586          | 2,599          | 208,752          | 200,500          | 200,500          |
| <b>Rail<sup>b</sup></b>             | <b>53,985</b>  | <b>49,912</b>  | <b>48,086</b>  | <b>16,380</b>  | <b>16,537</b>  | <b>16,543</b>  | <b>200,074</b>   | <b>180,419</b>   | <b>176,978</b>   |
| <b>Transit rail</b>                 | <b>N</b>       | <b>N</b>       | <b>N</b>       | <b>122</b>     | <b>171</b>     | <b>171</b>     | <b>N</b>         | <b>3,932</b>     | <b>4,325</b>     |

<sup>a</sup>Commercially navigable.

<sup>b</sup>Rail extent includes yard tracks, sidings and parallel lines.

**KEY:** N = Data are nonexistent. NA = Not applicable. U = Data are unavailable.

**NOTES**
**All Countries**

Road: The overall road total for Canada and the United States includes all roads (highways, local and others). Canada cannot disaggregate its data for local roads into paved and unpaved, however.

Rail: Data include length of track, including yard tracks, sidings and parallel lines.

Transit rail: Data are one-way, fixed guideway

**Mexico**

Road: Data do not include local roads.

Road, paved: Data include major roads plus minor rural roads.

**SOURCES**
**Canada**

 Road: Transportation Association of Canada. *Transportation in Canada: A Statistical Overview - 1995*. (Ottawa, Ont.: 1998).

 Great Lakes and inland waterways: Transport Canada. *Marine Distance Library, 1997*. (Ottawa, Ont.: 1998).

 Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue No. 55-201-XPB*, and *Gas Utilities, Transport and Distribution Systems, Catalogue No. 57-205-XPB*. (Ottawa, Ont.: various years).

 Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB*. (Ottawa, Ont.: various years).

**Mexico**

 Road: Secretaría de Comunicaciones y Transportes. Dirección General de Evaluación. *Longitud de la Infraestructura Carretera, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

 Pipeline: Instituto Nacional de Estadística, Geografía e Informática, based on data from the Petróleos Mexicanos. Subdirección de Planeación and the *Anuario Estadístico* (various years). (Aguascalientes, Ags.: various years).

 Rail: Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 y 1996*. (Mexico City, D.F.: various years).

Transit: Instituto Nacional de Estadística, Geografía e Informática, based on data collected by the Sistema de Transporte Colectivo and the Sistema de Transporte Eléctrico in Mexico City, the Sistema de Transporte Colectivo de la Zona Metropolitana de Guadalajara, and the Sistema de Transporte Colectivo in Monterrey. (Mexico City, D.F.: various years).

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**t a b l e 11-1****Domestic Physical System Extent—Continued****United States**

Road: U.S. Department of Transportation. Federal Highway Administration (FHWA). Unpublished data. (Washington, DC: 1998).

Great Lakes and inland waterways: U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).

Gas pipeline: American Gas Association. *Gas Facts*. (Arlington, VA: 1997).

Oil pipeline: Eno Transportation Foundation, Inc. *Transportation in America*. (Lansdowne, VA: 1997).

Freight rail: Association of American Railroads. *Railroad Facts*. (Washington, DC: 1997).

Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996).

Transit rail: American Public Transit Association. *Transit Fact book 1996*. (Washington, DC: 1996).

**t a b l e** 11-4a

## Top 20 Canadian Water Ports by Tonnage (Domestic and International): 1996

(Thousands of U.S. short tons)

| Port name   |                |                |                | Containerized shipments<br>(as percent of total tonnage) | Number of vessel entrances/clearances |
|---|----------------|----------------|----------------|--|---------------------------------------|
|   | Total          | Domestic       | International  |  |                                       |
| Vancouver, B.C.                                       | 78,711         | 2,192          | 76,518         | 7.2  | 5,673                                 |
| Sept-Îles/Pte-Noire, Que.                             | 24,895         | 4,648          | 20,246         | NS   | 615                                   |
| Port-Cartier, Que.                                    | 23,952         | 5,657          | 18,295         | NS   | 521                                   |
| Saint John, N.B.                                      | 22,680         | 2,151          | 20,529         | 1.2  | 825                                   |
| Montréal/Contrecoeur, Que.                            | 21,173         | 5,799          | 15,374         | 41.1   | 1,827                                 |
| Québec/Lévis, Que.                                    | 18,725         | 4,058          | 14,667         | NS   | 740                                   |
| Halifax, N.S.   | 14,977         | 2,975          | 12,002         | 29.6   | 1,761                                 |
| Hamilton, Ont.  | 14,062         | 6,822          | 7,240          | NS   | 638                                   |
| Thunder Bay, Ont.                                     | 11,134         | 7,237          | 3,898          | NS   | 518                                   |
| Prince Rupert, B.C.                                   | 10,419         | 15             | 10,404         | NS   | 561                                   |
| Port Hawkesbury, N.S.                                 | 8,692          | 36             | 8,655          | NS   | 180                                   |
| Fraser River, B.C.                                    | 8,297          | 5,954          | 2,344          | 1.6  | 3,479                                 |
| Come-By-Chance, Nfld.                                 | 8,191          | 115            | 8,077          | NS   | 148                                   |
| Nanticoke, Ont.                                       | 7,485          | 1,842          | 5,643          | NS   | 305                                   |
| Baie-Comeau, Que.                                     | 6,467          | 2,022          | 4,446          | NS   | 1,089                                 |
| Sorel, Que.   | 6,151          | 3,644          | 2,507          | NS   | 317                                   |
| Sault Ste. Marie, Ont.                                | 5,679          | 601            | 5,078          | NS   | 291                                   |
| Windsor, Ont.   | 5,600          | 2,763          | 2,836          | NS   | 422                                   |
| Howe Sound, B.C.                                      | 5,362          | 5,353          | 9              | NS   | 2,517                                 |
| East Coast Vancouver Island, B.C.                     | 4,478          | 4,478          | -              | NS   | 2,467                                 |
| Subtotal-top 20 ports                                 | 307,129        | 68,362         | 238,767        | 6.3  | 24,894                                |
| <b>Tonnage, total all Canadian water ports</b>        | <b>394,359</b> | <b>107,650</b> | <b>286,709</b> | <b>NA</b>  | <b>NA</b>                             |
| <b>Percent of tonnage of all Canadian water ports</b> | <b>78</b>      | <b>64</b>      | <b>83</b>      | <b>5.0</b>   | <b>NA</b>                             |

**KEY:** NA Not applicable. NS = Not significant.

**NOTE:** Ports are ranked by total tonnage.

**SOURCES**

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**t a b l e** 11-4b

## Top 20 Mexican Water Ports by Tonnage (Domestic and International): 1996

(Thousands of U.S. short tons)

| Port name  |                |               |                | Containerized shipments<br>(as percent of total tonnage) | Number of vessel<br>entrances/<br>clearances |
|--|----------------|---------------|----------------|--|--|
|  | Total          | Domestic      | International  |  |  |
| Cayo Arcas, Camp.                                    | 34,691         | 4             | 34,686         | NA   | 417  |
| Pajaritos, Ver.                                      | 34,560         | 6,702         | 27,858         | NA   | 954  |
| Dos Bocas, Tab.                                      | 25,835         | 49            | 25,786         | NA   | 1,145  |
| Salina Cruz, Oax.                                    | 18,517         | 12,785        | 5,732          | 0.8  | 537  |
| Isla Cedros, B.C.                                    | 16,297         | 8,277         | 8,019          | NA   | 1,189  |
| Lázaro Cárdenas, Mich.                               | 13,235         | 4,102         | 9,134          | 0.8  | 425  |
| Manzanillo, Col.                                     | 11,016         | 4,209         | 6,808          | 16.8   | 704  |
| Veracruz, Ver.                                       | 10,932         | 696           | 10,236         | 23.2   | 1,396  |
| Tampico, Tamps.                                      | 9,231          | 2,635         | 6,596          | 6.4  | 1,148  |
| Tuxpan, Ver.   | 7,768          | 4,658         | 3,110          | 0.1  | 327  |
| Guerrero Negro, B.C.S.                               | 7,595          | 7,595         | N              | NA   | 1,077  |
| Guaymas, Son.  | 6,239          | 2,704         | 3,535          | NA   | 496  |
| Punta Venado, Q. Roo.                                | 6,637          | NS            | 6,637          | NA   | 106  |
| Topolobampo, Sin.                                    | 3,275          | 3,090         | 185            | NA   | 247  |
| San Marcos, B.C.S.                                   | 3,071          | 7             | 3,064          | NA   | 308  |
| Rosarito, B.C.                                       | 2,908          | 1,791         | 1,117          | NA   | 99   |
| Coatzacoalcos, Ver.                                  | 2,682          | 601           | 2,081          | NA   | 267  |
| Altamira, Tamps.                                     | 2,661          | 138           | 2,523          | 41.6   | 667  |
| Progreso, Yuc.                                       | 2,560          | 1,044         | 1,516          | 3.7  | 462  |
| La Paz-Pichilingue, B.C.S.                           | 2,221          | 2,041         | 180            | NS   | 600  |
| Subtotal-top 20 ports                                | 221,929        | 63,126        | 158,803        | 2.9  | 12,571                                       |
| <b>Tonnage, total all Mexican water ports</b>        | <b>229,786</b> | <b>69,805</b> | <b>159,980</b> | <b>NA</b>  | <b>NA</b>                                    |
| <b>Percent of tonnage of all Mexican water ports</b> | <b>96.6</b>    | <b>90.4</b>   | <b>99.3</b>    | <b>2.8</b>   | <b>NA</b>                                    |

**KEY:** N = Data are nonexistent. NA = Not applicable. NS = Not significant.

**NOTE:** Ports are ranked by total tonnage.

**SOURCE:** Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

**t a b l e** 11-4c

## Top 20 U.S. Water Ports by Tonnage (Domestic and International): 1996

(Thousands of U.S. short tons)

| Port name   |                  |                  |                  | Containerized shipments<br>(as percent of total tonnage) | Number of vessel<br>entrances/<br>clearances |
|---|------------------|------------------|------------------|--|--|
|   | Total            | Domestic         | International    |  |  |
| South Louisiana, LA                               | 189,800          | 106,000          | 83,800           | NS   | 153,386                                      |
| Houston, TX                                       | 148,200          | 61,100           | 87,100           | 4.0  | 122,329                                      |
| New York, NY and NJ                               | 131,600          | 75,100           | 56,500           | 12.6   | 228,526                                      |
| New Orleans, LA                                   | 83,700           | 36,800           | 46,900           | 3.6  | 125,116                                      |
| Baton Rouge, LA                                   | 81,000           | 45,200           | 35,800           | NS   | 68,922                                       |
| Corpus Christi, TX                                | 80,500           | 23,800           | 56,600           | NS   | 32,957                                       |
| Valdez, AK  | 77,100           | 75,000           | 2,200            | NS   | 3,186  |
| Plaquemine, LA                                    | 66,900           | 46,200           | 20,700           | NS   | 65,780                                       |
| Long Beach, CA                                    | 58,400           | 22,400           | 36,000           | 35.0   | 56,465                                       |
| Texas City, TX                                    | 56,400           | 21,100           | 35,300           | NS   | 23,462                                       |
| Pittsburgh, PA                                    | 50,900           | 50,900           | -                | NS   | 118,283                                      |
| Mobile, AL  | 50,900           | 25,400           | 25,500           | NS   | 47,943                                       |
| Tampa, FL   | 49,300           | 32,500           | 16,800           | NS   | 10,234                                       |
| Norfolk Harbor, VA                                | 49,300           | 10,400           | 38,900           | 15.0   | 32,064                                       |
| Lake Charles, LA                                  | 49,100           | 19,700           | 29,400           | NS   | 49,303                                       |
| Los Angeles, CA                                   | 45,700           | 17,900           | 27,800           | 37.8   | 37,226                                       |
| Baltimore, MD                                     | 43,600           | 14,000           | 29,600           | 8.7  | 34,208                                       |
| Philadelphia, PA                                  | 41,900           | 13,000           | 28,900           | 2.6  | 25,185                                       |
| Duluth-Superior, MN and WI                        | 41,400           | 30,200           | 11,200           | NS   | 2,400  |
| Port Arthur, TX                                   | 37,200           | 6,500            | 30,700           | NS   | 12,890                                       |
| Subtotal-top 20 ports                             | 1,322,800        | 623,400          | 699,400          | 6.0  | 1,249,865                                    |
| <b>Tonnage, total all U.S. water ports</b>        | <b>2,284,100</b> | <b>1,100,700</b> | <b>1,183,400</b> | <b>NA</b>  | <b>NA</b>                                    |
| <b>Percent of tonnage of all U.S. water ports</b> | <b>57.9</b>      | <b>56.6</b>      | <b>59.1</b>      | <b>6.0</b>   | <b>NA</b>                                    |

**KEY:** NA = Not applicable. NS = Not significant.

**NOTE:** Ports are ranked by total tonnage.

**SOURCES**

Tonnage: U.S. Army Corps of Engineers. *Waterborne Commerce of the United States, National Summaries, Part 5.* (New Orleans, LA: 1996).

Percent of containerized shipments: U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).

**t a b l e** 12-2

# Vehicle-Miles by Mode

(Millions of vehicle miles)

|                             | Canada    |                            |           | Mexico    |           |           | United States    |                  |                          |
|-----------------------------|-----------|----------------------------|-----------|-----------|-----------|-----------|------------------|------------------|--------------------------|
|                             | 1990      | 1995                       | 1996      | 1990      | 1995      | 1996      | 1990             | 1995             | 1996                     |
| <b>Air</b>                  | <b>N</b>  | <b>N</b>                   | <b>N</b>  | <b>N</b>  | <b>N</b>  | <b>N</b>  | <b>8,793</b>     | <b>8,424</b>     | <b>8,335</b>             |
| Air carriers                | N         | N                          | N         | 78        | 222       | 190       | 3,963            | 4,629            | 4,811                    |
| <b>Road</b>                 | <b>N</b>  | <b><sup>e</sup>197,055</b> | <b>N</b>  | <b>N</b>  | <b>N</b>  | <b>N</b>  | <b>2,144,400</b> | <b>2,422,700</b> | <b>2,482,200</b>         |
| Personal vehicles           | N         | <sup>e</sup> 168,469       | N         | N         | N         | N         | 1,992,400        | 2,238,100        | 2,292,900                |
| Passenger cars              | N         | <sup>e</sup> 134,440       | N         | N         | N         | N         | 1,408,300        | 1,438,300        | 1,467,700                |
| Motorcycles                 | N         | <sup>e</sup> 649           | N         | N         | N         | N         | 9,600            | 9,800            | 9,900                    |
| Light trucks                | N         | <sup>e</sup> 33,380        | N         | N         | N         | N         | 574,600          | 790,000          | 815,300                  |
| Bus                         | 887       | 1,042                      | 996       | N         | N         | N         | 5,700            | 6,400            | 6,500                    |
| Charter                     | 62        | 84                         | 97        | N         | N         | N         | N                | N                | N                        |
| Intercity                   | 105       | 96                         | 81        | N         | N         | N         | N                | N                | N                        |
| Local motor                 | 478       | 461                        | 445       | N         | N         | N         | 2,130            | 2,184            | 2,165                    |
| School                      | 242       | 401                        | 373       | N         | N         | N         | N                | N                | N                        |
| Commercial freight vehicles | N         | <sup>e</sup> 27,545        | N         | N         | N         | N         | 146,200          | 178,200          | 182,800                  |
| Single-unit trucks          | N         | N                          | N         | N         | N         | N         | 51,900           | 62,700           | 64,000                   |
| Tractor                     | N         | N                          | N         | N         | N         | N         | 94,300           | 115,500          | 118,800                  |
| <b>Rail, train-miles</b>    | <b>78</b> | <b>87</b>                  | <b>84</b> | <b>30</b> | <b>24</b> | <b>25</b> | <b>413</b>       | <b>490</b>       | <b>499</b>               |
| Freight                     | 63        | 74                         | 70        | 17        | 15        | 16        | 380              | 458              | 469                      |
| Intercity passenger         | 15        | 13                         | 13        | 13        | 9         | 9         | 33               | 32               | 30                       |
| <b>Transit</b>              | <b>N</b>  | <b>N</b>                   | <b>N</b>  | <b>U</b>  | <b>U</b>  | <b>U</b>  | <b>3,242</b>     | <b>3,550</b>     | <b><sup>p</sup>3,663</b> |
| Transit rail                | N         | N                          | N         | U         | U         | U         | 774              | 810              | 822                      |

**KEY:** e = Data are estimated. N = Data are nonexistent. p = Data are preliminary. U = Data are unavailable.

**NOTES**
**Canada**

Road, all data except bus: The number of total road vehicle kilometers for 1995 is an estimate. See Appendix B for explanation.

Bus: All bus data are from a sample of Canadian companies engaged in scheduled intercity bus, urban transit, school bus and charter and other types of bus service from Statistics Canada's annual *Survey of the Passenger Bus and Urban Transit Industry*.

Transit: Although vehicle kilometers for transit rail are nonexistent, vehicle kilometers for local motor bus are included under road, buses.

**Mexico**

Air: Includes only kilometers traveled by domestic airlines under scheduled operations serving domestic and international flights.

Road: Although no data are collected for vehicle travel on all Mexican roads, the Mexican Institute of Transport (IMT) estimates that the total vehicle-kilometers for all types of passenger cars, trucks and buses using the main interurban road corridors (of which there are 10) is approximately 36 billion vehicle kilometers per year. Main interurban road corridors comprise 25,190 kilometers or approximately 5 percent of the Mexican national highway network. For additional information on main interurban road corridors and Mexico's national road network, see the Secretaría de Comunicaciones y Transportes (SCT) report, *Modernization of the Main Highway System* (Mexico City, D.F.: 1998.)

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**t a b l e** 12-2**Vehicle-Miles by Mode**—*Continued***Mexico**

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

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