

United States

Exports

1997

Issued April 2000

EC97TCF-US(EXP)

1997 Economic Census

Transportation

1997 Commodity Flow Survey



U.S. Department of Transportation
BUREAU OF TRANSPORTATION STATISTICS

U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU



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Mortimer L. Downey,
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Director
Rick Kowalewski,
Deputy Director
Rolf R. Schmitt,
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Director



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Administration**

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Assistant Director
for Economic Programs

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Chief, Service Sector
Statistics Division



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Dr. Ashish Sen,
Director

Rick Kowalewski,
Deputy Director

Rolf R. Schmitt,
Associate Director for
Transportation Studies

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Introduction to the Economic Census

PURPOSES AND USES OF THE ECONOMIC CENSUS

The economic census is the major source of facts about the structure and functioning of the Nation's economy. It provides essential information for government, business, industry, and the general public. Title 13 of the United States Code (Sections 131, 191, and 224) directs the Census Bureau to take the economic census every 5 years, covering years ending in 2 and 7.

The economic census furnishes an important part of the framework for such composite measures as the gross domestic product estimates, input/output measures, production and price indexes, and other statistical series that measure short-term changes in economic conditions. Specific uses of economic census data include the following:

- Policymaking agencies of the Federal Government use the data to monitor economic activity and assess the effectiveness of policies.
- State and local governments use the data to assess business activities and tax bases within their jurisdictions and to develop programs to attract business.
- Trade associations study trends in their own and competing industries, which allows them to keep their members informed of market changes.
- Individual businesses use the data to locate potential markets and to analyze their own production and sales performance relative to industry or area averages.

BASIS OF REPORTING

The economic census is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each store, factory, shop, or other location. Each establishment is assigned a separate industry classification based on its primary activity and not that of its parent company.

AVAILABILITY OF ADDITIONAL DATA

Reports in Print and Electronic Media

All results of the 1997 Economic Census are available on the Census Bureau Internet site (www.census.gov) and on compact discs (CD-ROM) for sale by the Census Bureau. Unlike previous censuses, only selected highlights are

published in printed reports. For more information, including a description of electronic and printed reports being issued, see the Internet site, or write to U.S. Census Bureau, Washington, DC 20233-8300, or call Customer Services at 301-457-4100.

HISTORICAL INFORMATION

The economic census has been taken as an integrated program at 5-year intervals since 1967 and before that for 1954, 1958, and 1963. Prior to that time, individual components of the economic census were taken separately at varying intervals.

The economic census traces its beginnings to the 1810 Decennial Census, when questions on manufacturing were included with those for population. Coverage of economic activities was expanded for the 1840 Decennial Census and subsequent censuses to include mining and some commercial activities. The 1905 Manufactures Census was the first time a census was taken apart from the regular decennial population census. Censuses covering retail and wholesale trade and construction industries were added in 1930, as were some covering service trades in 1933. Censuses of construction, manufacturing, and the other business service censuses were suspended during World War II.

The 1954 Economic Census was the first census to be fully integrated: providing comparable census data across economic sectors, using consistent time periods, concepts, definitions, classifications, and reporting units. It was the first census to be taken by mail, using lists of firms provided by the administrative records of other Federal agencies. Since 1963, administrative records also have been used to provide basic statistics for very small firms, reducing or eliminating the need to send them census questionnaires.

The range of industries covered in the economic censuses expanded between 1967 and 1992. The census of construction industries began on a regular basis in 1967, and the scope of service industries, introduced in 1933, was broadened in 1967, 1977, and 1987. While a few transportation industries were covered as early as 1963, it was not until 1992 that the census broadened to include all of transportation, communications, and utilities. Also new for 1992 was coverage of financial, insurance, and real estate industries. With these additions, the economic census and the separate census of governments and census of agriculture collectively covered roughly 98 percent of all economic activity.

Printed statistical reports from the 1992 and earlier censuses provide historical figures for the study of long-term time series and are available in some large libraries. All of the census reports printed since 1967 are still available for sale on microfiche from the Census Bureau. CD-ROMs issued from the 1987 and 1992 Economic Censuses contain databases including nearly all data published in print, plus additional statistics, such as ZIP Code statistics, published only on CD-ROM.

SOURCES FOR MORE INFORMATION

More information about the scope, coverage, classification system, data items, and publications for each of the economic censuses and related surveys is published in the *Guide to the 1997 Economic Census and Related Statistics* at www.census.gov/econguide. More information on the methodology, procedures, and history of the censuses will be published in the *History of the 1997 Economic Census* at www.census.gov/econ/www/history.html.

1997 Commodity Flow Survey

GENERAL

The 1997 Commodity Flow Survey (CFS) is undertaken through a partnership between the Bureau of the Census, U.S. Department of Commerce, and the Bureau of Transportation Statistics, U.S. Department of Transportation. This survey produces data on the movement of goods in the United States. It provides information on commodities shipped, their value, weight, and mode of transportation, as well as the origin and destination of shipments of manufacturing, mining, wholesale, and selected retail establishments. The CFS was last conducted in 1993. See the Comparability With the 1993 Commodity Flow Survey table (Appendix A) for a comparison between the 1997 and 1993 surveys. The data from the CFS are used by public policy analysts and for transportation planning and decision-making to assess the demand for transportation facilities and services, energy use, and safety risk and environmental concerns.

This report presents data on export shipment characteristics. Additional reports include data for the United States, census regions, divisions, and selected metropolitan areas, as well as selected data on hazardous material shipments.

EXPORTS

In this report, exports are defined as shipments with a destination outside of the United States. We asked the respondent to report the foreign city, country of destination, and mode of transport by which the shipment left the country. We also asked the respondent to report the U.S. port, airport, or border crossing of exit and report the "domestic mode" of transport used to reach the U.S. destination. Due to the exclusion of industries outside the scope of the CFS (see Industry Coverage), these data are not directly comparable to the 1997 merchandise trade exports published by the Department of Commerce.

STANDARD CLASSIFICATION OF TRANSPORTED GOODS (SCTG) CODES

The SCTG codes for this report are aggregated into nine commodity groupings. The following describes the two-digit SCTGs included in each commodity grouping:

SCTG group	SCTG title and two-digit codes	SCTG group	SCTG title and two-digit codes
01-05	Agricultural products and fish	22	Fertilizer and fertilizer materials
01	Live animals and live fish	23	Chemical products and preparations, n.e.c.
02	Cereal grains	24	Plastics and rubber
03	Agricultural products, except live animals, cereal grains and forage products	25-30	Wood products and textiles and leather
04	Animal feed and feed ingredients, cereal, straw, and eggs and other products of animal origin, n.e.c.	25	Logs and other wood in the rough
05	Meat, fish, seafood, and preparations	26	Wood products
06-09	Grains, alcohol, and tobacco products	27	Pulp, newsprint, paper, and paperboard
06	Milled grain products and preparations and bakery products	28	Paper or paperboard articles
07	Prepared foodstuffs, n.e.c. and fats and oils	29	Printed products
08	Alcoholic beverages	30	Textiles, leather, and articles
09	Tobacco products	31-34	Base metal and machinery
10-14	Stone, nonmetallic minerals, and metallic ores	31	Nonmetallic mineral products
10	Monumental or building stone	32	Base metal in primary or semifinished forms and in finished basic shapes
11	Natural sands	33	Articles of base metal
12	Gravel and crushed stone	34	Machinery
13	Nonmetallic minerals, n.e.c.	35-38	Electronics, motorized vehicles, and precision instruments
14	Metallic ores	35	Electronic and other electrical equipment and components, and office equipment
15-20	Coal and petroleum products	36	Vehicles
15	Coal	37	Transportation equipment, n.e.c.
17	Gasoline and aviation turbine fuel	38	Precision instruments and apparatus
18	Fuel oils	39-43	Furniture and miscellaneous manufactured products
19	Products of petroleum refining, n.e.c. and coal products	39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs
20	Basic chemical	40	Miscellaneous manufactured products
21-24	Pharmaceutical and chemical products	41	Waste and scrap
21	Pharmaceutical products	43	Mixed freight

INDUSTRY COVERAGE

The 1997 CFS covers business establishments in mining, manufacturing, wholesale trade, and selected retail industries. The survey also covers selected auxiliary establishments (e.g., warehouses) of in-scope multiunit and retail companies. The survey coverage excludes establishments classified as farms, forestry, fisheries, governments, construction, transportation, foreign establishments, services, and most establishments in retail.

The industries covered, as defined in the 1987 Standard Industrial Classification Manual (SIC), are listed in the following table:

SIC code	Title
10, ex. 108	Metal mining (excluding metal mining services)
12, ex. 124	Coal mining (excluding coal mining services)
13	Oil and gas extraction ¹
14, ex. 148	Mining and quarrying of nonmetallic minerals, except fuels (excluding nonmetallic minerals services)
20	Food and kindred products
21	Tobacco products
22	Textile mill products
23	Apparel and other finished products made from fabrics and similar materials
24	Lumber and wood products, except furniture
25	Furniture and fixtures
26	Paper and allied products
27, ex. 279	Printing, publishing, and allied industries (excluding service industries for the printing trade)
28	Chemicals and allied products
29	Petroleum refining and related industries
30	Rubber and miscellaneous plastics products
31	Leather and leather products
32	Stone, clay, glass, and concrete products
33	Primary metal industries
34	Fabricated metal products, except machinery and transportation equipment
35	Industrial and commercial machinery and computer equipment
36	Electronic and other electrical equipment and components, except computer equipment
37	Transportation equipment
38	Measuring, analyzing, and controlling instruments; photographic, medical and optical goods; watches and clocks
39	Miscellaneous manufacturing industries
50	Wholesale trade—durable goods
51	Wholesale trade—nondurable goods
596	Catalog and mail-order houses

¹We included establishments classified in SIC 13, Oil and Gas Extraction, in the initial coverage of the 1997 CFS. However, because of unresolved industry-wide reporting issues, we have removed shipments from these establishments from our 1997 CFS tabulations. The data collected from these establishments will be used as input to a special report at a later date.

Similarly, because establishments in SIC 13 are responsible for the overwhelming number of shipments classified in SCTG 16, Crude Petroleum, we have removed all shipments with SCTG 16 from the 1997 CFS publication results.

SHIPMENT COVERAGE

The CFS captures data on shipments originating from selected types of business establishments located in the 50 states and the District of Columbia. The data do not cover shipments originating from business establishments located in Puerto Rico and other U.S. possessions and territories. Shipments traversing the U.S. from a foreign location to another foreign location (e.g., from Canada to Mexico) are not included, nor are shipments from a foreign location to a U.S. location. Imported products are included in the CFS at the point that they left the importer's domestic location for shipment to another location. Shipments that are shipped through a foreign territory with both the origin and destination in the U.S. are included in the CFS data. The mileages calculated for these shipments exclude the international segments (e.g., shipments from New York to Michigan through Canada do not include any mileages for Canada). Export shipments are included, with the domestic destination defined as the port of exit from the U.S.

The "Industry Coverage" section of the text lists the SIC groups covered by the CFS. Other industry areas that are not covered, but may have significant shipping activity, include agriculture, government, and retail (other than warehouses and SIC 5961, Catalog and Mail-Order Houses). For agriculture specifically, this means that the CFS did not cover shipments of agricultural products from the farm site to the processing centers or terminal elevators (most likely short-distance local movements), but does cover the shipments of these products from the initial processing centers or terminal elevators onward.

MILEAGE CALCULATIONS

To compute shipment mileages for the 1997 CFS, The Center for Transportation Analysis (CTA) at Oak Ridge National Laboratory (ORNL) developed an integrated, intermodal transportation network modeling system. A secure data site was setup at ORNL to process census-supplied files containing data elements for individual CFS shipment records. Each record contained the ZIP Code of shipment origin and destination, and the mode or mode sequence reported. Each record also contained information on the type of commodity moved, its weight, dollar value and whether containerized or a hazardous material. Export shipments were also identified on the records, along with data on U.S. port of exit and foreign destination city and country. Encrypted data files were transmitted and returned from ORNL after processing, with turnaround of most files on a week-by-week basis. In this manner many shipment-specific data problems encountered by ORNL in their routing procedures were reported back to census in a timely fashion, allowing census to call back some shippers and thereby confirm, correct, or recover missing or otherwise unusable data. The ORNL system computed mileages, by mode, for all single modes and for any reported

multimodal sequence. This was done for any origin-destination pair of domestic ZIP Code locations, and for any internal ZIP Code of origin, via U.S. export port, to foreign (export) destination. Mileages between origin-destination ZIP Code centroids were computed by finding the minimum impedance path over mathematical representations of the highway, rail, waterway, air, and pipeline networks and then summing the lengths of individual links on these paths. Impedance is computed as a weighted combination of distance, time, and cost factors.

The ORNL multimodal network database is composed of individual modal-specific networks representing each of the major transportation modes—highway, rail, waterway, air, and pipeline. The links of these specific modal networks are the representation of line-haul transportation facilities. The nodes represent intersections and interchanges, and the access points to the transportation network. To simulate local access, test links are created from each five-digit ZIP Code centroid to nearby nodes on the network. For the truck network, local access is assumed to exist everywhere. For the other modes this is not true. Before any test links are created for these modes, a search procedure is used to determine if and where such networks are most likely to provide access to the ZIP Code. For shipments involving more than one mode, such as truck-rail or rail-water shipments, intermodal transfer links are added to the network database for the purpose of connecting the individual modal networks together for routing purposes. An intermodal terminals database and a number of terminal transfer models were developed at ORNL to identify likely transfer points for different classes of freight. A measure of link impedance was calculated for each access, line-haul, and intermodal transfer link traversed by a shipment. These impedances were mode specific and are based on various link characteristics. For example, the set of link characteristics for the highway network included speed impacting factors, such as the presence of divided or undivided roadway, the degree of access control, rural or urban setting, type of pavement, number of lanes, degree of urban congestion, and length of the link. Link impedance measures are also assigned to the local access links. Intermodal transfer link impedances are estimated in terms of the time it takes to move goods through such a transfer. In the case of rail and air freight, intercarrier transfer penalties are also considered in order to obtain proper route selections. A minimum path algorithm is used to find the minimum impedance path between a shipment's origin ZIP Code centroid and destination ZIP Code centroid. The cumulative length of the local access plus line-haul links on this path provides the estimated shipment distance. When rail was involved these shipment distances may be averaged over more than one path between an origin-destination pair.

Mileage Data for Pipeline Shipments

In the tables, we do not show ton-miles or average miles per shipment for pipeline shipments. For most of these shipments, the respondents reported the shipment

destination as a pipeline facility on the main pipeline network. Therefore, for the majority of these shipments, the resulting mileage represented only the access distance through feeder pipelines to the main pipeline network, and not the actual distance through the main pipeline network. Pipeline shipments are included in the U.S. totals for ton-miles and average miles per shipment.

DISCLOSURE RULES

In accordance with Federal law governing Census Bureau reports, no data are published that would disclose the operations of an individual firm or establishment.

EXPLANATION OF TERMS

Average miles per shipment. For the 1993 CFS, we excluded shipments of STCC 27, Printed Matter, from our calculation of average miles per shipment. We made this decision after determining that respondents in the 1993 CFS shipping newspapers, magazines, catalogs, etc., had used widely varying definitions of the term "shipment."

For the 1997 CFS, we made numerous efforts throughout our data collection and editing to produce consistent results from establishments shipping SCTG 29, Printed Products. As a result, we have included printed products in the average miles per shipment calculations for the 1997 CFS.

Commodity. Products that an establishment produces, sells, or distributes. This does not include items that are considered as excess or byproducts of the establishment's operation. Respondents reported the description and the five-digit SCTG code for the major commodity contained in the shipment, defined as the commodity with the greatest weight in the total shipment.

Distance shipped. In some tables, shipment data are presented for various "distance shipped" intervals. Shipments were categorized into these "distance shipped" intervals based on the great circle distance between their origin and destination ZIP Code centroids. All other distance-related data in this and other tables (i.e., ton-miles and average miles per shipment) are based on the mileage calculations produced by Oak Ridge National Laboratories. (See the "Mileage Calculations" section for more details.)

Great circle distance. The shortest distance between two points on the earth's surface.

Mode of transportation. The type of transportation used for moving the shipment to its domestic destination. For exports, the domestic destination was the port of exit.

Mode Definitions

In the instructions to the respondent, we defined the possible modes as follows:

1. **Parcel delivery/courier/U.S. Postal Service.** Delivery services, parcels, packages, and other small shipments that typically weigh less than 100 pounds. Includes bus parcel delivery service.
2. **Private truck.** Trucks operated by a temporary or permanent employee of an establishment or the buyer/receiver of the shipment.
3. **For-hire truck.** Trucks that carry freight for a fee collected from the shipper, recipient of the shipment, or an arranger of the transportation.
4. **Railroad.** Any common carrier or private railroad.
5. **Shallow draft vessels.** Barges, ships, or ferries operating primarily on rivers and canals; in harbors, the Great Lakes, the Saint Lawrence Seaway; the Intracoastal Waterway, the Inside Passage to Alaska, major bays and inlets; or in the ocean close to the shoreline.
6. **Deep draft vessel.** Barges, ships, or ferries operating primarily in the open ocean. Shipping on the Great Lakes and the Saint Lawrence Seaway is classified with shallow draft vessels.
7. **Pipeline.** Movements of oil, petroleum, gas, slurry, etc., through pipelines that extend to other establishments or locations beyond the shipper's establishment. Aqueducts for the movement of water are not included.
8. **Air.** Commercial or private aircraft, and all air service for shipments that typically weigh more than 100 pounds. Includes air freight and air express.
9. **Other mode.** Any mode not listed above.
10. **Unknown.** The shipment was not carried by a parcel delivery/courier/U.S. Postal Service, and the respondent could not determine what mode of transportation was used.

In the tables, we have used additional terms for mode, which we define as follows:

1. **Air (includes truck and air).** Shipments that used air or a combination of truck and air.
2. **Single modes.** Shipments using only one of the above-listed modes, except parcel or other and unknown.
3. **Multiple modes.** Parcel, U.S. Postal Service or courier shipments or shipments for which two or more of the following modes of transportation were used:

Private truck
 For-hire truck
 Rail
 Shallow draft vessel
 Deep draft vessel
 Pipeline

We did not allow for multiple modes in combination with "parcel, U.S. Postal Service or courier," "unknown," or "other." By their nature, these shipments may already include various kinds of multiple-mode activity. For example, if the respondent reported a shipment's mode of transportation as parcel and air, we treated the shipment as parcel only.

4. **Other multiple modes.** Shipments using any other mode combinations not specifically listed in the tables.
5. **Other and unknown modes.** Shipments for which modes were not reported, or were reported by the respondent as "Other" or "Unknown."
6. **Truck.** Shipments using for-hire truck only, private truck only, or a combination of for-hire truck and private truck.
7. **Water.** Shipments using shallow draft vessel only, deep draft vessel only, or Great Lakes vessel only. Combinations of these modes, such as shallow draft vessel and Great Lakes vessel are included as "Other multiple modes."
8. **Great Lakes.** In the tables in this publication, "Great Lakes" appears as a single mode. ORNL's transportation network and mileage calculation system allowed for separate mileage calculations for Great Lakes between the origin and destination ZIP Codes (see the "Mileage Calculations" section for more details).

Other Definitions and Terms

Shipment. A shipment (or delivery) is an individual movement of commodities from an establishment to a customer or to another location of the originating company (including a warehouse, distribution center, retail or wholesale outlet). A shipment uses one or more modes of transportation including parcel delivery, U.S. Postal Service, courier, private truck, for-hire truck, rail, water, pipeline, air, and other modes.

Standard Classification of Transported Goods

(SCTG). The commodities shown in this report are classified using the SCTG coding system. The SCTG coding system was developed jointly by agencies of the United States and Canadian governments based on the Harmonized System to address statistical needs in regard to products transported.

Ton-miles. The weight times the mileage for a shipment. The respondents reported shipment weight in pounds, as described below. Mileage was calculated as the distance between the shipment origin and destination ZIP Codes. For shipments by truck, rail, or shallow draft vessels, the mileage excludes international segments. For example, mileages from Alaska to the continental United States

exclude any mileages through Canada (see the “Mileage Calculations” section for more details). Aggregated pound-miles were converted to ton-miles. The ton-miles data are displayed in millions.

Tons shipped. The total weight of the entire shipment. Respondents reported the weight in pounds. Aggregated pounds were converted to short-tons (2,000 pounds). The tons data are displayed in thousands.

Total modal activity. The overall activity (e.g., ton-miles) of a specific mode of transportation, whether used in a single-mode shipment, or as part of a multiple-mode shipment. For example, the total modal activity for private truck is the total ton-miles carried by private truck in single-mode shipments, combined with the total ton-miles carried by private truck in all multiple-mode shipments that include private truck (private truck and for-hire truck, private truck and rail, private truck and air, etc.)

Value of shipments. The dollar value of the entire shipment. This was defined as the net selling value, f.o.b. plant, exclusive of freight charges and excise taxes. The value data are displayed in millions of dollars.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in the tables for this publication:

D	Denotes figures withheld to avoid disclosing data for individual companies.
–	Represents zero or less than 1 unit of measure.
S	Data do not meet publication standards due to high sampling variability or other reasons.
CFS	Commodity Flow Survey.
lb	Pounds.
n.e.c.	Not elsewhere classified.
NA	Not applicable.
n.o.s.	Not otherwise specified.

OTHER TRANSPORTATION DATA

Users of transportation data may be especially interested in the following reports:

Economic Census: Transportation Sector covers establishments that provide passenger and freight transportation to the general public, government, or other businesses.

Published data include kind of business, geographic location, total operating revenue, annual and first quarter payroll, and number of employees for pay period including March 12.

Vehicle Inventory and Use Survey covers state and U.S. level statistics on the physical and operational characteristics of the Nation’s truck, van, minivan, and sport utility vehicle population. Some of the types of data collected include number of vehicles, major use, body type, annual miles, model year, vehicle size, fuel type, operator classification, engine size, range of operation, weeks operated, products carried, and hazardous materials carried. This survey shows comparative statistics reflecting percent changes in number of vehicles between 1997 and 1992 for most characteristics.

Transportation Annual Survey covers firms with paid employees that provide commercial motor freight transportation and public warehousing services. Data collected include operating revenue and operating revenue by source, total expenses and expenses percentage of motor carrier freight revenue by commodity type, size of shipments handled, length of haul, and vehicle fleet inventory.

All results of the 1997 Economic Census are available on the Census Bureau Internet site <http://www.census.gov> and on compact discs (CD-ROM).

For more information on any Census Bureau product, including a description of electronic and printed reports being issued, see the web site or call Customer Services at 301-457-4100.

Table 1. Export Shipment Characteristics by Export Mode of Transportation: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text. Detail may not add to total because of rounding]

Export mode of transportation	Value		Tons	
	Number (million dollars)	Percent	Number (thousands)	Percent
All modes	577 802	100.0	526 233	100.0
Truck ¹	111 942	19.4	57 838	11.0
For-hire truck	99 783	17.3	41 798	7.9
Private truck	12 159	2.1	16 040	3.0
Rail	22 878	4.0	36 849	7.0
Water	163 490	28.3	349 206	66.4
Shallow draft vessel	4 909	.8	20 925	4.0
Deep draft vessel	158 581	27.4	328 281	62.4
Air (includes truck and air)	196 706	34.0	4 419	.8
Pipeline ²	S	S	S	S
Parcel, U.S. Postal Service or courier	17 550	3.0	2 033	.4
Other and unknown modes	64 299	11.1	71 411	13.6

– Represents data cell equal to zero or less than 1 unit of measure.

D Denotes figures withheld to avoid disclosing data for individual companies.

S Data do not meet publication standards because of high sampling variability or other reasons. Some unpublished estimates can be derived from other data published in this table. However, figures obtained in this manner are subject to these same limitations.

¹"Truck" as a single mode includes shipments which went by private truck only, for-hire truck only, or a combination of private truck and for-hire truck.

²CFS data for pipeline exclude most shipments of crude oil. See "Mileage Calculations" section for details of CFS coverage.

Note: Deep draft vessel totals include Great Lakes shipments.

Table 2. Export Shipment Characteristics by Domestic Mode of Transportation: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text. Detail may not add to total because of rounding]

Domestic mode of transportation	Value		Tons		Ton-miles	
	Number (million dollars)	Percent	Number (thousands)	Percent	Number (millions)	Percent
All modes	577 802	100.0	526 233	100.0	219 138	100.0
Single modes	451 418	78.1	397 260	75.5	182 111	83.1
Truck ¹	338 936	58.7	155 737	29.6	51 074	23.3
For-hire truck	269 397	46.6	98 062	18.6	43 075	19.7
Private truck	67 438	11.7	53 501	10.2	7 640	3.5
Rail	37 621	6.5	139 034	26.4	91 123	41.6
Water	16 586	2.9	97 046	18.4	37 475	17.1
Shallow draft vessel	9 603	1.7	61 392	11.7	34 970	16.0
Great Lakes	730	.1	4 315	.8	177	–
Deep draft vessel	6 253	1.1	31 339	6.0	2 328	1.1
Air (includes truck and air)	57 318	9.9	972	.2	763	.3
Pipeline ²	S	S	S	S	S	S
Multiple modes	60 764	10.5	15 792	3.0	17 561	8.0
Parcel, U.S. Postal Service or courier	40 789	7.1	398	–	183	–
Truck and rail	19 067	3.3	9 011	1.7	9 958	4.5
Truck and water	681	.1	2 585	.5	2 157	1.0
Rail and water	66	–	2 703	.5	5 154	2.4
Other multiple modes	161	–	1 094	.2	109	–
Other and unknown modes	65 620	11.4	113 181	21.5	19 466	8.9

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D Denotes figures withheld to avoid disclosing data for individual companies.

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¹"Truck" as a single mode includes shipments which went by private truck only, for-hire truck only, or a combination of private truck and for-hire truck.

²CFS data for pipeline exclude most shipments of crude oil. See "Mileage Calculations" section for details of CFS coverage.

Table 3. Export Shipment Characteristics by Country of Destination: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text. Detail may not add to total because of rounding]

Country of destination	Value		Tons	
	Number (million dollars)	Percent	Number (thousands)	Percent
Total	577 802	100.0	526 233	100.0
Canada	112 683	19.5	99 073	18.8
Mexico	54 272	9.4	36 869	7.0
All others	410 847	71.1	390 291	74.2

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Table 4. Export Shipment Characteristics by Export Mode of Transportation and Country of Destination: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text. Detail may not add to total because of rounding]

Export mode of transportation and country of destination	Value		Tons	
	Number (million dollars)	Percent	Number (thousands)	Percent
Total	577 802	100.0	526 233	100.0
CANADA				
All modes	112 683	100.0	99 073	100.0
Truck ¹	68 554	60.8	38 183	38.5
For-hire truck	60 937	54.1	26 372	26.6
Private truck	7 618	6.8	11 811	11.9
Rail	13 157	11.7	22 213	22.4
Water	2 200	2.0	29 045	29.3
Shallow draft vessel	1 058	.9	18 019	18.2
Deep draft vessel	1 142	1.0	11 026	11.1
Air (includes truck and air)	10 527	9.3	269	.3
Pipeline ²	S	S	S	S
Parcel, U.S. Postal Service or courier	4 759	4.2	306	.3
Other and unknown modes	13 410	11.9	8 722	8.8
MEXICO				
All modes	54 272	100.0	36 869	100.0
Truck ¹	34 073	62.8	12 544	34.0
For-hire truck	31 484	58.0	10 606	28.8
Private truck	2 589	4.8	1 938	5.3
Rail	S	S	S	S
Water	S	S	S	S
Shallow draft vessel	S	S	S	S
Deep draft vessel	S	S	S	S
Air (includes truck and air)	2 571	4.7	47	.1
Pipeline ²	S	S	S	S
Parcel, U.S. Postal Service or courier	537	1.0	24	–
Other and unknown modes	5 637	10.4	1 972	5.3
ALL OTHERS				
All modes	410 847	100.0	390 291	100.0
Truck ¹	9 315	2.3	7 111	1.8
For-hire truck	7 362	1.8	4 820	1.2
Private truck	1 953	.5	2 290	.6
Rail	564	.1	1 209	.3
Water	158 993	38.7	311 307	79.8
Shallow draft vessel	3 734	.9	2 858	.7
Deep draft vessel	155 259	37.8	308 448	79.0
Air (includes truck and air)	183 608	44.7	4 103	1.1
Pipeline ²	S	S	S	S
Parcel, U.S. Postal Service or courier	12 255	3.0	1 704	.4
Other and unknown modes	45 252	11.0	60 717	15.6

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¹"Truck" as a single mode includes shipments which went by private truck only, for-hire truck only, or a combination of private truck and for-hire truck.

²CFS data for pipeline exclude most shipments of crude oil. See "Mileage Calculations" section for details of CFS coverage.

Note: Deep draft vessel totals include Great Lakes shipments.

Table 5. Export Shipment Characteristics by Commodity Group: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text. Detail may not add to total because of rounding]

SCTG code group	Description	Value		Tons	
		Number (million dollars)	Percent	Number (thousands)	Percent
	All commodities	577 802	100.0	526 233	100.0
01-05	Agricultural products and fish	46 808	8.1	179 342	34.1
06-09	Grains, alcohol, and tobacco products	12 211	2.1	15 705	3.0
10-14	Stone, Nonmetallic minerals, and metallic ores	3 471	.6	17 198	3.3
15-20	Coal and petroleum products	43 413	7.5	144 243	27.4
21-24	Pharmaceutical and chemical products	45 286	7.8	24 837	4.7
25-30	Wood products, and textiles and leather	42 560	7.4	78 684	15.0
31-34	Base metal and machinery	83 363	14.4	25 406	4.8
35-38	Electronics, motorized vehicles, and precision instruments	260 327	45.1	13 454	2.6
39-43	Furniture and miscellaneous manufactured products	35 030	6.1	26 118	5.0
--	Commodity unknown	5 332	.9	1 246	.2

– Represents data cell equal to zero or less than 1 unit of measure.

D Denotes figures withheld to avoid disclosing data for individual companies.

S Data do not meet publication standards because of high sampling variability or other reasons. Some unpublished estimates can be derived from other data published in this table. However, figures obtained in this manner are subject to these same limitations.

Note: Data exclude shipments of SCTG 16, Crude Petroleum. See the section "Industry Coverage" for additional information.

Table 6. Export Shipment Characteristics by Two-Digit Commodity: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text. Detail may not add to total because of rounding]

SCTG code	Commodity description	Value		Tons	
		Number (million dollars)	Percent	Number (thousands)	Percent
	All commodities	577 802	100.0	526 233	100.0
01	Live animals and live fish	49	–	28	–
02	Cereal grains	16 477	2.9	127 399	24.2
03	Other agricultural products	15 487	2.7	37 571	7.1
04	Animal feed and products of animal origin, n.e.c.	5 002	.9	10 394	2.0
05	Meat, fish, seafood, and their preparations	9 794	1.7	3 950	.8
06	Milled grain products and preparations, and bakery products	2 241	.4	3 989	.8
07	Other prepared foodstuffs and fats and oils	7 550	1.3	10 022	1.9
08	Alcoholic beverages	1 784	.3	1 580	.3
09	Tobacco products	635	.1	114	–
10	Monumental or building stone	61	–	168	–
11	Natural sands	209	–	2 954	.6
12	Gravel and crushed stone	17	–	3 886	.7
13	Nonmetallic minerals n.e.c.	889	.2	5 122	1.0
14	Metallic ores and concentrates	2 295	.4	5 068	1.0
15	Coal	1 989	.3	73 298	13.9
17	Gasoline and aviation turbine fuel	3 252	.6	16 426	3.1
18	Fuel oils	781	.1	3 699	.7
19	Coal and petroleum products, n.e.c.	3 146	.5	14 922	2.8
20	Basic chemicals	34 246	5.9	35 898	6.8
21	Pharmaceutical products	13 597	2.4	352	–
22	Fertilizers	1 918	.3	12 268	2.3
23	Chemical products and preparations, n.e.c.	12 216	2.1	4 642	.9
24	Plastics and rubber	17 555	3.0	7 576	1.4
25	Logs and other wood in the rough	2 140	.4	S	S
26	Wood products	5 669	1.0	18 876	3.6
27	Pulp, newsprint, paper, and paperboard	7 762	1.3	14 338	2.7
28	Paper or paperboard articles	2 653	.5	2 002	.4
29	Printed products	6 551	1.1	1 137	.2
30	Textiles, leather, and articles of textiles or leather	17 786	3.1	3 102	.6
31	Nonmetallic mineral products	4 696	.8	5 616	1.1
32	Base metal in primary or semifinished forms and in finished basic shapes	10 937	1.9	10 162	1.9
33	Articles of base metal	12 636	2.2	4 263	.8
34	Machinery	55 093	9.5	5 365	1.0
35	Electronic and other electrical equipment and components and office equipment	155 507	26.9	3 871	.7
36	Motorized and other vehicles (including parts)	50 996	8.8	8 951	1.7
37	Transportation equipment, n.e.c.	31 862	5.5	336	–
38	Precision instruments and apparatus	21 962	3.8	296	–
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs ..	2 925	.5	587	.1
40	Miscellaneous manufactured products	26 084	4.5	2 661	.5
41	Waste and scrap	3 828	.7	22 349	4.2
43	Mixed freight	2 193	.4	521	.1
--	Commodity unknown	5 332	.9	1 246	.2

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Note: Data exclude shipments of SCTG 16, Crude Petroleum. See the section "Industry Coverage" for additional information.

Table 7. Export Shipment Characteristics by Commodity Group and Export Mode of Transportation: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text. Detail may not add to total because of rounding]

Commodity code group, description, and export mode of transportation	Value		Tons	
	Number (million dollars)	Percent	Number (thousands)	Percent
ALL COMMODITIES				
All modes	577 802	100.0	526 233	100.0
Truck ¹	111 942	19.4	57 838	11.0
For-hire truck	99 783	17.3	41 798	7.9
Private truck	12 159	2.1	16 040	3.0
Rail	22 878	4.0	36 849	7.0
Water	163 490	28.3	349 206	66.4
Shallow draft vessel	4 909	.8	20 925	4.0
Deep draft vessel	158 581	27.4	328 281	62.4
Air (includes truck and air)	196 706	34.0	4 419	.8
Pipeline ²	S	S	S	S
Parcel, U.S. Postal Service or courier	17 550	3.0	2 033	.4
Other and unknown modes	64 299	11.1	71 411	13.6
SCTG 01-05, AGRICULTURAL PRODUCTS AND FISH				
All modes	46 808	8.1	179 342	34.1
Truck ¹	3 857	.7	5 823	1.1
For-hire truck	3 134	.5	4 685	.9
Private truck	723	.1	1 138	.2
Rail	827	.1	3 363	.6
Water	33 497	5.8	132 276	25.1
Shallow draft vessel	S	S	S	S
Deep draft vessel	32 936	5.7	129 972	24.7
Air (includes truck and air)	1 054	.2	245	—
Pipeline ²	S	S	S	S
Parcel, U.S. Postal Service or courier	32	—	117	—
Other and unknown modes	7 534	1.3	37 516	7.1
SCTG 06-09, GRAINS, ALCOHOL, AND TOBACCO PRODUCTS				
All modes	12 211	2.1	15 705	3.0
Truck ¹	2 775	.5	2 553	.5
For-hire truck	2 053	.4	1 746	.3
Private truck	722	.1	807	.2
Rail	574	.1	1 735	.3
Water	6 344	1.1	7 720	1.5
Shallow draft vessel	275	—	237	—
Deep draft vessel	6 070	1.1	7 484	1.4
Air (includes truck and air)	225	—	24	—
Pipeline ²	S	S	S	S
Parcel, U.S. Postal Service or courier	88	—	37	—
Other and unknown modes	2 204	.4	3 636	.7
SCTG 10-14, STONE, NONMETALLIC MINERALS, AND METALLIC ORES				
All modes	3 471	.6	17 198	3.3
Truck ¹	451	—	1 976	.4
For-hire truck	413	—	1 202	.2
Private truck	38	—	774	.1
Rail	285	—	5 493	1.0
Water	2 106	.4	7 851	1.5
Shallow draft vessel	121	—	S	S
Deep draft vessel	1 985	.3	6 154	1.2
Air (includes truck and air)	S	S	32	—
Pipeline ²	—	—	—	—
Parcel, U.S. Postal Service or courier	S	S	360	—
Other and unknown modes	264	—	1 486	.3
SCTG 15-20, COAL AND PETROLEUM PRODUCTS				
All modes	43 413	7.5	144 243	27.4
Truck ¹	7 069	1.2	11 333	2.2
For-hire truck	6 393	1.1	8 285	1.6
Private truck	676	.1	S	S
Rail	10 369	1.8	17 620	3.3
Water	21 900	3.8	98 784	18.8
Shallow draft vessel	1 103	.2	15 417	2.9
Deep draft vessel	20 797	3.6	83 367	15.8
Air (includes truck and air)	554	.1	92	—
Pipeline ²	S	S	S	S
Parcel, U.S. Postal Service or courier	182	—	424	—
Other and unknown modes	2 470	.4	11 692	2.2

See footnotes at end of table.

Table 7. Export Shipment Characteristics by Commodity Group and Export Mode of Transportation: 1997—Con.

[For explanation of terms and meaning of abbreviations and symbols, see introductory text. Detail may not add to total because of rounding]

Commodity code group, description, and export mode of transportation	Value		Tons	
	Number (million dollars)	Percent	Number (thousands)	Percent
SCTG 21-24, PHARMACEUTICAL AND CHEMICAL PRODUCTS				
All modes	45 286	7.8	24 837	4.7
Truck ¹	9 044	1.6	3 428	.7
For-hire truck	7 725	1.3	2 987	.6
Private truck	1 319	.2	441	—
Rail	1 395	.2	1 869	.4
Water	16 695	2.9	15 987	3.0
Shallow draft vessel	675	.1	149	—
Deep draft vessel	16 021	2.8	15 838	3.0
Air (includes truck and air)	12 245	2.1	293	—
Pipeline ²	S	S	S	S
Parcel, U.S. Postal Service or courier	705	.1	56	—
Other and unknown modes	5 193	.9	3 202	.6
SCTG 25-30, WOOD PRODUCTS, AND TEXTILES AND LEATHER				
All modes	42 560	7.4	78 684	15.0
Truck ¹	8 953	1.5	11 588	2.2
For-hire truck	7 496	1.3	6 081	1.2
Private truck	1 457	.3	S	S
Rail	392	—	814	.2
Water	20 405	3.5	58 708	11.2
Shallow draft vessel	369	—	420	—
Deep draft vessel	20 036	3.5	58 289	11.1
Air (includes truck and air)	4 567	.8	550	.1
Pipeline ²	S	S	S	S
Parcel, U.S. Postal Service or courier	1 593	.3	218	—
Other and unknown modes	6 648	1.2	6 637	1.3
SCTG 31-34, BASE METAL AND MACHINERY				
All modes	83 363	14.4	25 406	4.8
Truck ¹	23 164	4.0	8 579	1.6
For-hire truck	20 767	3.6	7 444	1.4
Private truck	2 396	.4	1 135	.2
Rail	1 932	.3	2 173	.4
Water	26 569	4.6	9 023	1.7
Shallow draft vessel	708	.1	373	—
Deep draft vessel	25 860	4.5	8 650	1.6
Air (includes truck and air)	18 407	3.2	1 963	.4
Pipeline ²	S	S	S	S
Parcel, U.S. Postal Service or courier	2 097	.4	457	—
Other and unknown modes	11 166	1.9	3 208	.6
SCTG 35-38, ELECTRONICS, MOTORIZED VEHICLES, AND PRECISION INSTRUMENTS				
All modes	260 327	45.1	13 454	2.6
Truck ¹	49 464	8.6	6 339	1.2
For-hire truck	45 672	7.9	5 683	1.1
Private truck	3 792	.7	656	.1
Rail	6 546	1.1	1 484	.3
Water	24 489	4.2	2 887	.5
Shallow draft vessel	S	S	98	—
Deep draft vessel	23 943	4.1	2 789	.5
Air (includes truck and air)	145 423	25.2	1 006	.2
Pipeline ²	16	—	S	S
Parcel, U.S. Postal Service or courier	10 866	1.9	164	—
Other and unknown modes	23 522	4.1	1 573	.3
SCTG 39-43, FURNITURE AND MISCELLANEOUS MANUFACTURED PRODUCTS				
All modes	35 030	6.1	26 118	5.0
Truck ¹	6 698	1.2	6 056	1.2
For-hire truck	5 691	1.0	3 535	.7
Private truck	1 007	.2	2 521	.5
Rail	419	—	2 243	.4
Water	10 863	1.9	15 536	3.0
Shallow draft vessel	536	—	226	—
Deep draft vessel	10 327	1.8	15 310	2.9
Air (includes truck and air)	11 033	1.9	193	—
Pipeline ²	S	S	S	S
Parcel, U.S. Postal Service or courier	1 785	.3	S	S
Other and unknown modes	4 228	.7	1 891	.4

See footnotes at end of table.

Table 7. Export Shipment Characteristics by Commodity Group and Export Mode of Transportation: 1997—Con.

[For explanation of terms and meaning of abbreviations and symbols, see introductory text. Detail may not add to total because of rounding]

Commodity code group, description, and export mode of transportation	Value		Tons	
	Number (million dollars)	Percent	Number (thousands)	Percent
COMMODITY UNKNOWN				
All modes	5 332	.9	1 246	.2
Truck ¹	467	—	164	—
For-hire truck	438	—	152	—
Private truck	29	—	12	—
Rail	S	S	55	—
Water	621	.1	431	—
Shallow draft vessel	S	S	S	S
Deep draft vessel	606	.1	427	—
Air (includes truck and air)	2 848	.5	21	—
Pipeline ²	—	—	—	—
Parcel, U.S. Postal Service or courier	187	—	S	S
Other and unknown modes	S	S	S	S

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¹"Truck" as a single mode includes shipments which went by private truck only, for-hire truck only, or a combination of private truck and for-hire truck.

²CFS data for pipeline exclude most shipments of crude oil. See "Mileage Calculations" section for details of CFS coverage.

Note: Data exclude shipments of SCTG 16, Crude Petroleum. See the section "Industry Coverage" for additional information.

Note: Deep draft vessel totals include Great Lakes shipments.

Table 8. Export Shipment Characteristics by Selected State of Origin: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text. Detail may not add to total because of rounding]

State of origin	Value		Tons	
	Number (million dollars)	Percent	Number (thousands)	Percent
Total	577 802	100.0	526 233	100.0
California	77 262	13.4	34 690	6.6
Florida	26 455	4.6	13 927	2.6
Georgia	13 122	2.3	7 973	1.5
Iowa	6 471	1.1	5 721	1.1
Illinois	25 454	4.4	23 019	4.4
Kentucky	8 371	1.4	12 785	2.4
Louisiana	14 656	2.5	63 270	12.0
Maine	2 095	.4	S	S
Michigan	22 918	4.0	8 757	1.7
Minnesota	10 582	1.8	12 759	2.4
Mississippi	2 854	.5	9 275	1.8
New York	24 220	4.2	8 828	1.7
Ohio	24 578	4.3	12 513	2.4
Oregon	10 548	1.8	28 855	5.5
Pennsylvania	20 341	3.5	13 030	2.5
Texas	80 978	14.0	63 985	12.2
Virginia	8 502	1.5	17 461	3.3
Washington	32 814	5.7	73 253	13.9
West Virginia	3 267	.6	31 878	6.1
Wyoming	392	—	6 324	1.2
All other states	161 920	28.0	70 244	13.3

— Represents data cell equal to zero or less than 1 unit of measure.
D Denotes figures withheld to avoid disclosing data for individual companies.
S Data do not meet publication standards because of high sampling variability or other reasons. Some unpublished estimates can be derived from other data published in this table. However, figures obtained in this manner are subject to these same limitations.

Note: States were selected based on estimated tons without regard to sampling variability.

Appendix A.

Comparability With the 1993 Commodity Flow Survey

The Commodity Flow Survey (CFS) restores a data program on commodity flows that the Census Bureau conducted as a part of its 5-year economic census program from 1963 through 1977. The CFS was first conducted in

1993. For the 1997 CFS, the Census Bureau incorporated improvements identified from the evaluation of previous surveys and additional research. The following table shows a comparison of the 1993 and 1997 surveys.

Item	1993	1997
1. Industry coverage	Manufacturers (minor exceptions) Mining (except mining services and oil and gas extraction) All wholesale Video tape distributors Catalog mail-order houses Auxiliaries (e.g., warehouses)	Manufacturers (minor exceptions) Mining (except mining services) All wholesale Catalog mail-order houses Auxiliaries (e.g., warehouses)
2. Commodity classification system	Standard Transportation Commodity Classification (STCC), developed by the American Association of Railroads (AAR).	Standard Classification of Transported Goods (SCTG).
3. Sample size	Approximately 200,000 establishments were selected from a universe of about 800,000 in-scope establishments on the 1992 Standard Statistical Establishment List (SSEL).	Approximately 100,000 establishments were selected from a universe of about 800,000 in-scope establishments on the 1995 Standard Statistical Establishment List (SSEL).
4. Survey methodology	Respondents took a sample of their individual outbound shipments for a 2-week period during each of the four calendar quarters of 1993. Respondents reported key characteristics for each sampled shipment.	Respondents took a sample of their individual outbound shipments for a 1-week period during each of the four calendar quarters of 1997. Respondents reported key characteristics for each sampled shipment.
5. Reported mode of transportation	Rail For-hire truck Private truck Air Inland water and/or Great Lakes Deep sea water Pipeline Parcel, U.S. Postal Service, or courier Other Unknown	Rail For-hire truck Private truck Air Shallow draft vessel Deep draft vessel Pipeline Parcel, U.S. Postal Service, or courier Other Unknown

Item	1993	1997
6. Data items requested on questionnaire	<p>For each shipment:</p> <p>Total value</p> <p>Total weight</p> <p>Major commodity (STCC)</p> <p>All modes of transportation</p> <p>Multiple origins (respondents specifically requested to report all shipment origins for the sampled establishment and report the appropriate origin for each shipment; assumed to always be the mailing address if no other origins listed).</p> <p>Destination</p> <p>Containerized (Y/N)</p> <p>Hazardous material (Y/N)</p> <p>Export (Y/N)</p> <p>If export, mode of export, foreign country, and city of destination.</p>	<p>For each shipment:</p> <p>Total value</p> <p>Total weight</p> <p>Major commodity (SCTG)</p> <p>All modes of transportation</p> <p>Single origin (assumed to be the mailing address unless the respondent provided a different physical location address).</p> <p>Destination</p> <p>Containerized (Y/N)</p> <p>Hazardous material (UN/NA codes)</p> <p>Export (Y/N)</p> <p>If export, mode of export, foreign country, and city of destination.</p>

Appendix B.

Reliability of the Estimates

An estimate based on a sample survey potentially contains two types of errors—sampling and nonsampling. Sampling error occurs because characteristics differ among sampling units and because only a subset of the entire population is measured in a sample survey. Nonsampling error encompasses all other factors that contribute to the total error of a sample survey estimate. The accuracy of a survey result may be affected by these two types of errors.

Sampling and nonsampling errors are often measured by the quantities, bias and variance. The bias of an estimator of an unknown population value is the difference, averaged over all possible samples of the same size and design, between the estimator and the unknown population value. Any systematic error, or inaccuracy that affects all samples of a specified design in a similar way, may bias the resulting estimates. Variance is the squared difference, averaged over all possible samples of the same size and design, between an estimator and its average value. Descriptions of sampling and nonsampling errors for the 1997 Commodity Flow Survey (CFS) are provided in the following sections.

SAMPLING ERROR

Because the estimates are based on a sample, exact agreement with the results that would be obtained from a complete enumeration of all the shipments made in 1997 from all establishments included on the CFS sampling frame is not expected. However, because probability sampling was used at each stage of selection, it is possible to estimate the sampling variability of the survey estimates. For CFS estimates, sampling variability arises from each of the three stages of sampling. (See Appendix C for a description of the sample design.)

The particular sample used in this survey is one of a large number of samples of the same size and design that could have been selected. If all possible samples had been surveyed, under the same conditions, an estimate of an unknown population value could have been obtained from each sample. The estimates obtained from these samples give rise to a distribution of estimates for the unknown population value. A statistical measure of the variability among these estimates is the standard error, which can be approximated from any one sample. The coefficient of variation (or relative standard error) of an estimate is the standard error of the estimate divided by the estimate. Measures of sampling variability, such as the standard error or coefficient of variation, are estimated from the

sample and are also subject to sampling variability. (Technically, we should refer to the estimated standard error or the estimated coefficient of variation of an estimator. However, we have omitted this detail for the sake of brevity.) It is important to note that the standard error and coefficient of variation only measure sampling variability. They do not measure any biases in the estimates. All coefficients of variation are expressed as percents. Standard errors for the corresponding percentage estimates are also provided.

An estimate of an unknown population value and its approximate standard error can be used to construct a confidence interval. A confidence interval is a range about a given estimator that has a specified probability, or confidence, of containing the unknown population value. If, for each possible sample, an estimate of an unknown population value and the estimate's approximate standard error were obtained, then:

1. For approximately 90 percent of the possible samples, the interval from 1.65 standard errors below to 1.65 standard errors above the estimate would include the unknown population value.
2. For approximately 95 percent of the possible samples, the interval from two standard errors below to two standard errors above the estimate would include the unknown population value.

NONSAMPLING ERROR

Nonsampling error encompasses all other factors that contribute to the total error of a sample survey estimate and may also occur in censuses. It is often helpful to think of nonsampling error as arising from deficiencies or mistakes in the survey process. In the CFS, nonsampling error can be attributed to many sources: (1) nonresponse, (2) response errors, (3) differences in the interpretation of the questions, (4) mistakes in coding or keying the data obtained, and (5) other errors of collection, response, coverage, and processing. Although no direct measurement of the potential biases because of nonsampling error has been obtained, precautionary steps were taken in all phases of the collection, processing, and tabulation of the data in an effort to minimize its influence.

A potentially large source of bias in the estimates is due to nonresponse. Nonresponse is defined as the inability to obtain all the intended measurements or responses from all the selected establishments. Four levels of nonresponse can occur in the CFS: item, shipment, quarter (reporting week), and establishment. Item nonresponse

occurs either when a question is unanswered or the response to the question fails computer or analyst edits. Item nonresponse is corrected by imputation. (Imputation is the procedure by which a missing value is replaced by a predicted value obtained from an appropriate model.) Shipment, quarter, and establishment nonresponse are used to describe the inability to obtain sufficient information about a sampled shipment, quarter, or establishment, respectively, that prevents it from contributing to tabulations. Shipment and quarter nonresponse are corrected during the estimation procedure by reweighting. Reweighting allocates characteristics to the nonrespondents in proportion to the characteristics observed for the respondents. The amount of bias introduced by this nonresponse adjustment procedure depends on the extent to which the nonrespondents differ, characteristically, from the respondents. Establishment nonresponse is corrected during the estimation procedure by the SIC-level adjustment weight. (See Appendix C for a description of the estimation procedure.) In most cases of establishment nonresponse, none of the four questionnaires have been

returned to the Census Bureau, after several attempts to elicit a response. Approximately 67 percent of the sampled establishments provided at least one quarter of data that contributed to tabulations.

Some possible sources of bias that are attributed to respondent-conducted sampling include misunderstanding the definition of a shipment, constructing an incomplete frame of shipments from which to sample, ordering the shipment sampling frame by selected shipment characteristics, and selecting shipment records by a method other than the one specified in the questionnaire's instructions. We often contacted respondents who reported shipments having atypically large value or weight when compared to the rest of their reported shipments. Upon contact, if we are able to collect information on all of a given respondent's large shipments made either for a particular reporting week or for the entire quarter, then we identify these large shipments as certainty shipments. (See Appendix C for a description of how certainty shipments are used in the estimation process.)

Table B-1. Measures of Reliability for Export Shipment Characteristics by Export Mode of Transportation: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text]

Export mode of transportation	Value		Tons	
	Coefficient of variation of number	Standard error of percentage	Coefficient of variation of number	Standard error of percentage
All modes	16.0	—	15.4	—
Truck	18.3	1.2	16.9	1.8
For-hire truck	18.6	1.1	18.6	1.4
Private truck	15.7	.3	22.7	1.4
Rail	23.3	.7	23.2	1.1
Water	15.2	1.7	14.9	3.7
Shallow draft vessel	18.8	.2	23.8	1.2
Deep draft vessel	15.2	1.6	15.0	4.1
Air (includes truck and air)	16.2	2.6	17.1	.2
Pipeline	S	S	S	S
Parcel, U.S. Postal Service or courier	15.6	.4	19.4	.1
Other and unknown modes	15.4	.9	20.0	2.5

— Represents data cell equal to zero or less than 1 unit of measure.
D Denotes figures withheld to avoid disclosing data for individual companies.
S Data do not meet publication standards because of high sampling variability or other reasons.

Note: For description of development and uses of measures of reliability, see Appendix B, Reliability of the Estimates.

Table B-2. Measures of Reliability for Export Shipment Characteristics by Domestic Mode of Transportation: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text]

Domestic mode of transportation	Value		Tons		Ton-miles	
	Coefficient of variation of number	Standard error of percentage	Coefficient of variation of number	Standard error of percentage	Coefficient of variation of number	Standard error of percentage
All modes	16.0	—	15.4	—	18.6	—
Single modes	16.3	1.4	17.3	5.8	18.8	2.1
Truck	16.8	2.3	20.9	5.4	16.4	2.7
For-hire truck	16.8	1.7	18.3	2.3	17.6	2.6
Private truck	17.6	.9	45.5	5.7	25.5	1.6
Rail	20.5	.7	20.7	3.4	21.5	4.4
Water	18.6	.8	17.9	4.6	19.2	2.7
Shallow draft vessel	22.1	.5	19.9	3.7	20.1	2.5
Great Lakes	47.2	.1	41.9	.7	49.5	.1
Deep draft vessel	22.9	.5	23.0	2.5	46.0	1.2
Air (includes truck and air)	22.9	3.4	21.2	—	32.1	.2
Pipeline	S	S	S	S	S	S
Multiple modes	17.1	1.1	21.5	.4	21.3	1.1
Parcel, U.S. Postal Service or courier	17.5	.5	18.5	—	25.2	—
Truck and rail	18.0	.7	16.9	.1	14.6	.9
Truck and water	25.7	—	33.3	.2	29.9	.3
Rail and water	27.3	—	43.3	.3	45.4	2.6
Other multiple modes	40.4	—	49.4	.2	45.1	—
Other and unknown modes	15.5	1.3	22.6	5.9	20.8	2.2

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S Data do not meet publication standards because of high sampling variability or other reasons.

Note: For description of development and uses of measures of reliability, see Appendix B, Reliability of the Estimates.

Table B-3. Measures of Reliability for Export Shipment Characteristics by Country of Destination: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text]

Country of destination	Value		Tons	
	Coefficient of variation of number	Standard error of percentage	Coefficient of variation of number	Standard error of percentage
Total	16.0	-	15.4	-
Canada	17.0	1.0	18.8	2.9
Mexico	20.9	1.2	24.2	2.1
All others	15.4	1.6	15.3	3.3

- Represents data cell equal to zero or less than 1 unit of measure.
D Denotes figures withheld to avoid disclosing data for individual companies.
S Data do not meet publication standards because of high sampling variability or other reasons.

Note: For description of development and uses of measures of reliability, see Appendix B, Reliability of the Estimates.

Table B-4. Measures of Reliability for Export Shipment Characteristics by Export Mode of Transportation and Country of Destination: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text]

Export mode of transportation and country of destination	Value		Tons	
	Coefficient of variation of number	Standard error of percentage	Coefficient of variation of number	Standard error of percentage
Total	16.0	-	15.4	-
CANADA				
All modes	17.0	-	18.8	-
Truck	16.3	2.0	16.6	6.8
For-hire truck	16.5	1.8	16.8	7.1
Private truck	16.3	.9	30.4	4.1
Rail	23.0	1.7	24.0	3.7
Water	21.6	.6	22.6	6.6
Shallow draft vessel	34.2	.6	25.8	6.6
Deep draft vessel	30.4	.3	27.6	3.3
Air (includes truck and air)	17.8	1.7	24.2	.1
Pipeline	S	S	S	S
Parcel, U.S. Postal Service or courier	15.7	.8	19.2	.1
Other and unknown modes	19.4	1.4	26.6	1.9
MEXICO				
All modes	20.9	-	24.2	-
Truck	23.2	6.5	22.4	6.7
For-hire truck	23.9	6.5	23.9	4.8
Private truck	16.7	2.3	23.5	3.1
Rail	S	S	S	S
Water	S	S	S	S
Shallow draft vessel	S	S	S	S
Deep draft vessel	S	S	S	S
Air (includes truck and air)	16.8	1.5	19.1	-
Pipeline	S	S	S	S
Parcel, U.S. Postal Service or courier	30.1	1.1	40.6	.2
Other and unknown modes	45.2	6.3	20.9	1.4
ALL OTHERS				
All modes	15.4	-	15.3	-
Truck	19.4	.3	19.3	.4
For-hire truck	20.7	.2	22.7	.3
Private truck	18.1	-	20.9	.1
Rail	21.4	-	22.3	.1
Water	15.3	1.9	15.2	2.8
Shallow draft vessel	17.8	.1	19.8	.2
Deep draft vessel	15.3	1.8	15.2	2.8
Air (includes truck and air)	16.1	2.8	17.4	.4
Pipeline	S	S	S	S
Parcel, U.S. Postal Service or courier	16.6	.4	20.1	.2
Other and unknown modes	15.3	1.0	20.6	2.9

- Represents data cell equal to zero or less than 1 unit of measure.
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Note: For description of development and uses of measures of reliability, see Appendix B, Reliability of the Estimates.

Table B-5. Measures of Reliability for Export Shipment Characteristics by Commodity Group: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text]

SCTG code group	Description	Value		Tons	
		Coefficient of variation of number	Standard error of percentage	Coefficient of variation of number	Standard error of percentage
	All commodities	16.0	—	15.4	—
01-05	Agricultural products and fish	14.6	1.2	16.0	5.2
06-09	Grains, alcohol, and tobacco products	13.0	.3	14.5	.6
10-14	Stone, Nonmetallic minerals, and metallic ores	22.5	.1	22.3	.8
15-20	Coal and petroleum products	23.6	1.2	20.4	3.3
21-24	Pharmaceutical and chemical products	14.4	.5	14.5	1.2
25-30	Wood products, and textiles and leather	15.3	.6	28.9	4.8
31-34	Base metal and machinery	15.9	.9	17.4	.8
35-38	Electronics, motorized vehicles, and precision instruments	17.2	2.9	15.9	.2
39-43	Furniture and miscellaneous manufactured products	13.9	1.1	18.3	1.0
--	Commodity unknown	25.3	.4	39.3	.2

— Represents data cell equal to zero or less than 1 unit of measure.
D Denotes figures withheld to avoid disclosing data for individual companies.
S Data do not meet publication standards because of high sampling variability or other reasons.

Note: For description of development and uses of measures of reliability, see Appendix B, Reliability of the Estimates.

Table B-6. Measures of Reliability for Export Shipment Characteristics by Two-Digit Commodity: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text]

SCTG code	Commodity description	Value		Tons	
		Coefficient of variation of number	Standard error of percentage	Coefficient of variation of number	Standard error of percentage
	All commodities	16.0	—	15.4	—
01	Live animals and live fish	38.7	—	36.5	—
02	Cereal grains	18.8	.8	17.2	4.0
03	Other agricultural products	16.1	.6	20.4	2.2
04	Animal feed and products of animal origin, n.e.c.	19.0	.1	21.2	.3
05	Meat, fish, seafood, and their preparations	18.3	.5	18.0	.2
06	Milled grain products and preparations, and bakery products	18.1	—	21.8	.3
07	Other prepared foodstuffs and fats and oils	14.8	.2	16.7	.4
08	Alcoholic beverages	15.1	.1	15.8	.1
09	Tobacco products	30.3	—	31.7	—
10	Monumental or building stone	42.2	—	22.7	—
11	Natural sands	42.7	—	49.9	.7
12	Gravel and crushed stone	25.1	—	28.5	.2
13	Nonmetallic minerals n.e.c.	22.0	—	22.2	—
14	Metallic ores and concentrates	23.3	.1	31.4	.4
15	Coal	20.9	—	21.1	2.0
17	Gasoline and aviation turbine fuel	39.5	.4	39.0	1.8
18	Fuel oils	38.8	—	44.9	.4
19	Coal and petroleum products, n.e.c.	24.0	.1	25.4	.6
20	Basic chemicals	25.4	1.1	24.9	1.3
21	Pharmaceutical products	17.2	.3	17.8	—
22	Fertilizers	20.1	.1	17.1	1.0
23	Chemical products and preparations, n.e.c.	16.5	.3	16.6	.2
24	Plastics and rubber	15.3	.4	17.1	.3
25	Logs and other wood in the rough	20.3	.2	S	S
26	Wood products	20.9	.1	37.6	1.5
27	Pulp, newsprint, paper, and paperboard	14.6	.1	14.9	.5
28	Paper or paperboard articles	16.0	—	18.1	—
29	Printed products	22.5	.5	19.3	—
30	Textiles, leather, and articles of textiles or leather	16.6	.3	19.3	—
31	Nonmetallic mineral products	14.0	.1	19.8	.2
32	Base metal in primary or semifinished forms and in finished basic shapes	15.5	.1	28.7	.8
33	Articles of base metal	18.3	.3	19.4	.1
34	Machinery	16.1	.6	17.4	.1
35	Electronic and other electrical equipment and components and office equipment	19.0	2.6	18.2	—
36	Motorized and other vehicles (including parts)	17.2	.8	15.2	.2
37	Transportation equipment, n.e.c.	36.1	3.4	16.4	—
38	Precision instruments and apparatus	19.9	.5	21.6	—
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	25.1	.3	21.5	—
40	Miscellaneous manufactured products	14.0	.9	14.5	—
41	Waste and scrap	15.9	.1	19.5	1.0
43	Mixed freight	31.6	.2	22.8	—
--	Commodity unknown	25.3	.4	39.3	.2

— Represents data cell equal to zero or less than 1 unit of measure.
D Denotes figures withheld to avoid disclosing data for individual companies.
S Data do not meet publication standards because of high sampling variability or other reasons.

Note: For description of development and uses of measures of reliability, see Appendix B, Reliability of the Estimates.

Table B-7. Measures of Reliability for Export Shipment Characteristics by Commodity Group and Export Mode of Transportation: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text]

Commodity code group, description, export mode of transportation	Value		Tons	
	Coefficient of variation of number	Standard error of percentage	Coefficient of variation of number	Standard error of percentage
ALL COMMODITIES				
All modes	16.0	—	15.4	—
Truck	18.3	1.2	16.9	1.8
For-hire truck	18.6	1.1	18.6	1.4
Private truck	15.7	.3	22.7	1.4
Rail	23.3	.7	23.2	1.1
Water	15.2	1.7	14.9	3.7
Shallow draft vessel	18.8	.2	23.8	1.2
Deep draft vessel	15.2	1.6	15.0	4.1
Air (includes truck and air)	16.2	2.6	17.1	.2
Pipeline	S	S	S	S
Parcel, U.S. Postal Service or courier	15.6	.4	19.4	.1
Other and unknown modes	15.4	.9	20.0	2.5
SCTG 01-05, AGRICULTURAL PRODUCTS AND FISH				
All modes	14.6	1.2	16.0	5.2
Truck	16.5	—	20.1	.2
For-hire truck	16.8	—	21.8	.1
Private truck	21.8	—	18.3	—
Rail	23.6	—	25.6	.3
Water	14.0	1.1	15.4	4.7
Shallow draft vessel	S	S	S	S
Deep draft vessel	14.1	1.1	15.7	4.6
Air (includes truck and air)	26.0	—	25.0	—
Pipeline	S	S	S	S
Parcel, U.S. Postal Service or courier	29.0	—	28.2	—
Other and unknown modes	23.1	.3	26.6	2.4
SCTG 06-09, GRAINS, ALCOHOL, AND TOBACCO PRODUCTS				
All modes	13.0	.3	14.5	.6
Truck	15.1	—	15.0	—
For-hire truck	17.4	—	17.3	—
Private truck	23.6	—	24.9	—
Rail	18.7	—	21.6	.1
Water	13.9	.2	18.9	.4
Shallow draft vessel	18.6	—	26.5	—
Deep draft vessel	14.3	.2	19.6	.4
Air (includes truck and air)	30.0	—	31.3	—
Pipeline	S	S	S	S
Parcel, U.S. Postal Service or courier	28.5	—	45.0	—
Other and unknown modes	14.6	—	13.5	.2
SCTG 10-14, STONE, NONMETALLIC MINERALS, AND METALLIC ORES				
All modes	22.5	.1	22.3	.8
Truck	16.8	—	23.1	.1
For-hire truck	17.6	—	26.2	—
Private truck	28.6	—	39.7	—
Rail	38.1	—	27.5	.3
Water	29.2	.1	30.2	.8
Shallow draft vessel	27.7	—	S	S
Deep draft vessel	29.9	—	31.6	.4
Air (includes truck and air)	S	S	29.3	—
Pipeline	—	—	—	—
Parcel, U.S. Postal Service or courier	S	S	29.4	—
Other and unknown modes	29.5	—	23.6	—
SCTG 15-20, COAL AND PETROLEUM PRODUCTS				
All modes	23.6	1.2	20.4	3.3
Truck	25.4	.2	26.3	.5
For-hire truck	26.8	.2	26.6	.3
Private truck	44.9	.1	S	S
Rail	31.1	.5	29.4	.9
Water	22.2	.6	20.1	2.5
Shallow draft vessel	26.0	—	29.9	1.0
Deep draft vessel	22.1	.6	19.7	2.3
Air (includes truck and air)	17.5	—	35.4	—
Pipeline	S	S	S	S
Parcel, U.S. Postal Service or courier	26.4	—	25.8	—
Other and unknown modes	17.1	—	27.4	.8

See footnotes at end of table.

Table B-7. **Measures of Reliability for Export Shipment Characteristics by Commodity Group and Export Mode of Transportation: 1997—Con.**

[For explanation of terms and meaning of abbreviations and symbols, see introductory text]

Commodity code group, description, export mode of transportation	Value		Tons	
	Coefficient of variation of number	Standard error of percentage	Coefficient of variation of number	Standard error of percentage
SCTG 21-24, PHARMACEUTICAL AND CHEMICAL PRODUCTS				
All modes	14.4	.5	14.5	1.2
Truck	16.4	.2	16.9	.1
For-hire truck	15.8	.2	17.5	.1
Private truck	22.5	—	27.0	—
Rail	17.1	—	18.6	—
Water	15.6	.4	16.7	1.1
Shallow draft vessel	25.6	—	25.8	—
Deep draft vessel	15.4	.4	16.8	1.1
Air (includes truck and air)	18.9	.4	19.9	—
Pipeline	S	S	S	S
Parcel, U.S. Postal Service or courier	17.8	—	19.9	—
Other and unknown modes	15.8	.2	23.7	.3
SCTG 25-30, WOOD PRODUCTS, AND TEXTILES AND LEATHER				
All modes	15.3	.6	28.9	4.8
Truck	15.8	.2	29.5	1.7
For-hire truck	16.0	.2	27.3	.9
Private truck	17.5	—	S	S
Rail	17.0	—	17.5	—
Water	16.2	.3	39.1	4.7
Shallow draft vessel	20.9	—	32.5	—
Deep draft vessel	16.3	.3	39.4	4.8
Air (includes truck and air)	16.9	.2	23.3	—
Pipeline	S	S	S	S
Parcel, U.S. Postal Service or courier	22.2	.1	20.8	—
Other and unknown modes	20.7	.4	27.8	.8
SCTG 31-34, BASE METAL AND MACHINERY				
All modes	15.9	.9	17.4	.8
Truck	17.8	.2	17.6	.2
For-hire truck	17.6	.2	17.7	.2
Private truck	19.8	—	19.8	—
Rail	34.2	.2	28.8	.1
Water	16.2	.5	31.2	.8
Shallow draft vessel	23.1	—	30.9	—
Deep draft vessel	16.5	.4	32.7	.8
Air (includes truck and air)	16.2	.3	22.5	.2
Pipeline	S	S	S	S
Parcel, U.S. Postal Service or courier	17.1	—	24.3	—
Other and unknown modes	19.0	.4	17.6	.1
SCTG 35-38, ELECTRONICS, MOTORIZED VEHICLES, AND PRECISION INSTRUMENTS				
All modes	17.2	2.9	15.9	.2
Truck	20.4	.9	15.9	.1
For-hire truck	21.1	1.0	16.2	.1
Private truck	16.4	.2	16.6	—
Rail	24.5	.2	19.3	—
Water	17.1	.4	16.0	—
Shallow draft vessel	S	S	47.0	—
Deep draft vessel	17.1	.4	15.8	—
Air (includes truck and air)	17.4	3.0	17.7	—
Pipeline	46.4	—	S	S
Parcel, U.S. Postal Service or courier	17.0	.3	24.6	—
Other and unknown modes	18.9	.9	17.2	—
SCTG 39-43, FURNITURE AND MISCELLANEOUS MANUFACTURED PRODUCTS				
All modes	13.9	1.1	18.3	1.0
Truck	14.9	.2	22.0	.2
For-hire truck	15.8	.2	19.2	.1
Private truck	25.5	—	29.2	.1
Rail	26.9	—	28.1	.1
Water	15.0	.4	20.8	1.0
Shallow draft vessel	28.9	—	22.9	—
Deep draft vessel	14.9	.4	21.0	1.0
Air (includes truck and air)	19.1	.7	17.3	—
Pipeline	S	S	S	S
Parcel, U.S. Postal Service or courier	17.7	—	S	S
Other and unknown modes	16.4	.1	22.9	—

See footnotes at end of table.

Table B-7. Measures of Reliability for Export Shipment Characteristics by Commodity Group and Export Mode of Transportation: 1997—Con.

[For explanation of terms and meaning of abbreviations and symbols, see introductory text]

Commodity code group, description, export mode of transportation	Value		Tons	
	Coefficient of variation of number	Standard error of percentage	Coefficient of variation of number	Standard error of percentage
COMMODITY UNKNOWN				
All modes	25.3	.4	39.3	.2
Truck	22.0	—	24.6	—
For-hire truck	22.5	—	25.4	—
Private truck	32.2	—	34.0	—
Rail	S	S	42.5	—
Water	23.8	—	46.8	.1
Shallow draft vessel	S	S	S	S
Deep draft vessel	23.9	—	47.1	.1
Air (includes truck and air)	25.9	.1	24.1	—
Pipeline	—	—	—	—
Parcel, U.S. Postal Service or courier	31.4	—	S	S
Other and unknown modes	S	S	S	S

— Represents data cell equal to zero or less than 1 unit of measure.
D Denotes figures withheld to avoid disclosing data for individual companies.
S Data do not meet publication standards because of high sampling variability or other reasons.

Note: For description of development and uses of measures of reliability, see Appendix B, Reliability of the Estimates.

Table B-8. Measures of Reliability for Export Shipment Characteristics by Selected State of Origin: 1997

[For explanation of terms and meaning of abbreviations and symbols, see introductory text]

State of origin	Value		Tons	
	Coefficient of variation of number	Standard error of percentage	Coefficient of variation of number	Standard error of percentage
Total	16.0	—	15.4	—
California	14.9	1.3	22.5	2.1
Florida	20.7	.8	16.8	.3
Georgia	18.5	.2	16.4	.2
Iowa	19.5	.2	23.3	.2
Illinois	18.2	.5	22.1	.6
Kentucky	21.8	.2	34.5	1.1
Louisiana	18.6	1.0	24.4	5.0
Maine	13.0	.1	S	S
Michigan	17.5	.3	18.0	.2
Minnesota	18.5	.2	21.8	.4
Mississippi	17.6	—	27.3	.4
New York	16.7	.3	20.4	.3
Ohio	17.1	.4	22.7	.6
Oregon	20.3	.3	27.8	1.8
Pennsylvania	22.4	.5	25.3	.6
Texas	22.9	2.6	21.3	2.4
Virginia	18.1	.4	32.4	1.4
Washington	34.1	3.3	32.5	5.3
West Virginia	21.0	—	23.6	1.3
Wyoming	26.4	—	30.5	.4
All other states	14.9	1.7	16.7	1.5

— Represents data cell equal to zero or less than 1 unit of measure.
D Denotes figures withheld to avoid disclosing data for individual companies.
S Data do not meet publication standards because of high sampling variability or other reasons.

Note: For description of development and uses of measures of reliability, see Appendix B, Reliability of the Estimates.

Appendix C.

Sample Design, Data Collection, and Estimation

INTRODUCTION

The primary goal for the 1997 Commodity Flow Survey (CFS) is to estimate shipping volumes (value, tons, and ton-miles) by commodity and mode of transportation at varying levels of geographic detail. A detailed description of the sample design for the 1997 CFS is provided below.

SAMPLE DESIGN

The sample for the 1997 CFS is selected using a stratified three-stage design in which the first-stage sampling units are establishments, the second-stage sampling units are groups of four 1-week periods (reporting weeks) within the survey year, and the third-stage sampling units are shipments.

First Stage

To create the first-stage sampling frame, we extracted a subset of establishment records from the 1995 Standard Statistical Establishment List (SSEL). The SSEL is a database, maintained by the Bureau of the Census, that contains a record for each establishment with employees. (An establishment is a single physical location where business transactions take place.) Establishments having nonzero payroll in 1994 and classified in the mining, manufacturing, wholesale, or selected retail industries, as defined by the 1987 Standard Industrial Classification (SIC) Manual, are included on the sampling frame. Auxiliary establishments (e.g. warehouses and central administrative offices) with shipping activity are also included. Auxiliary establishments are establishments that are primarily involved in rendering support services for other establishments within the same company, instead of for the public, government, or other business firms. All other establishments contained on the sampling frame are referred to as nonauxiliary establishments. For each establishment we extracted sales, payroll, number of employees, name and address information, as well as a primary identifier. We also computed a measure of size for each establishment. The measure of size for a particular establishment is designed to approximate the establishment's total value of shipments for 1994.

To reduce the amount of sampling variability and because estimates are desired for each commodity, we used a stratified design with a certainty component for each three-digit SIC. To accomplish this, each establishment on the sampling frame is classified into a three-digit

SIC grouping. For each group of establishments, a boundary (or cutoff) that divides the certainty establishments from the noncertainty establishments is determined using the Lavallee-Hidiroglou algorithm. If an establishment's measure of size is greater than the cutoff, the establishment is selected "with certainty". Establishments selected "with certainty" were assured of being selected and represented only themselves (i.e., have a selection probability of one and a sampling weight of one). No certainty cutoffs are set for auxiliary establishments because they only make up a small portion of the estimated total value of shipments for all establishments on the sampling frame.

Establishments not selected with certainty make up the noncertainty universe. We stratify the noncertainty universe by SIC recode, National Transportation Analysis Region (NTAR), and a flag used to differentiate auxiliary establishments from nonauxiliary establishments. Each SIC recode is constructed from a group of related three-digit SIC codes. The NTARs, developed by the Department of Transportation as combinations of Bureau of Economic Analysis (BEA) Areas, collectively provide a mutually exclusive and exhaustive coverage of the United States. Finally, the auxiliary stratification came about because establishments with different types of operation may have different shipping practices. We refer to a particular SIC recode-NTAR-auxiliary flag combination as a primary stratum.

We further stratify the noncertainty establishments within each primary stratum using the measure of size previously described. We refer to these measure-of-size strata as substrata of the primary strata. The measure of size stratification increases the efficiency of the sample design. The Dalenius-Hodges cumulative rule is used to set the substratum boundaries. We then use Neyman allocation to determine the sample size required within each substratum to meet a coefficient of variation constraint on the primary stratum total measure of size. Within each substratum, a simple random sample of establishments is selected without replacement.

To arrive at the final sample size, we allocated additional establishments to some of the strata so that the probability of selecting any establishment is no less than 1 in 100. In total, the first-stage sample comprises 102,739 establishments.

Second Stage

The frame for the second stage of sampling consists of 52 one-week reporting periods (reporting weeks) during the interval from December 29, 1996, to December 26,

1997. Each establishment selected for the 1997 CFS was systematically assigned to report for a group of four reporting weeks throughout the survey year. The four reporting weeks in a given group are separated by 12 weeks. For example, an establishment might be requested to report data for the 5th, 18th, 31st, and 44th weeks of the survey year.

Third Stage

For each of the four reporting weeks in which an establishment is asked to report, we request the respondent to construct a sampling frame that consists of all shipments made by their establishment in each particular reporting week. For any particular reporting week, if an establishment makes 40 or fewer shipments during that week, we ask the respondent to provide information about all of their establishment's shipments from that week, i.e., no sampling is required. For establishments making more than 40 shipments in a given reporting week, we ask the respondent to select a systematic sample of these shipments and to provide us with information only about the selected shipments. The size of a particular respondent's sample for a given reporting week should be between 20 and 40 shipments, depending on the total number of shipments the establishment made during that reporting week.

DATA COLLECTION

Each establishment selected into the CFS sample is mailed a questionnaire for each of its four reporting weeks. For a given establishment, we request the respondent to provide the following information about their establishment's shipments: domestic destination or port of exit, commodity, value, weight, mode(s) of transportation, the date on which the shipment was made, and an indication of whether the shipment was an export, hazardous material, or containerized. For shipments that include more than one commodity, respondents are instructed to report the commodity that makes up the greatest percentage of the shipment's weight. For exports, we also ask the respondent to provide the mode of export and the foreign destination city and country.

We used two versions of the questionnaire to collect data from the sampled establishments—the CFS-1000 and the CFS-2000. Each establishment received the CFS-1000 in each of its first three reporting weeks. However, for the fourth reporting week, a subsample of approximately 25,000 establishments received the CFS-2000, while the remaining establishments received the CFS-1000. The CFS-2000 requests the respondent to provide additional information about their establishment's access to on-site and off-site shipping facilities, as well as transportation equipment. See Appendix E for a copy of each questionnaire.

ESTIMATION

Each shipment has associated with it a single tabulation weight, that is used in computing all estimates to which

the shipment contributes. The tabulation weight is a product of seven different weights. A description of each weight follows.

CFS respondents provide data for a sample of shipments made by their respective establishments in the survey year. For each establishment, we produce an estimate of that establishment's total value of shipments for the entire survey year. To do this, we use four different weights, the shipment weight, the shipment nonresponse weight, the quarter weight, and the quarter nonresponse weight.

Like establishments, we identify shipments as either certainty or noncertainty. (See the Nonsampling Error section in Appendix B for a description of how certainty shipments are identified.) For noncertainty shipments, the shipment weight is defined as the ratio of the total number of noncertainty shipments (as reported by the respondent) made by an establishment in a reporting week to the number of sampled noncertainty shipments for the same week. This weight uses the data from the sampled shipments to represent all the establishment's shipments made in the reporting week. However, some respondents fail to provide sufficient information about a sampled shipment. For example, a respondent may not be able to provide value, weight, or a destination ZIP Code for some of the sampled shipments. If these data items cannot be imputed, then these shipments would not contribute to tabulations and are deemed "unusable." (A usable shipment is one that has valid entries for value, weight, and origin and destination ZIP Codes.) To account for these "unusable" shipments, we apply the shipment nonresponse weight. For noncertainty shipments from a particular establishment's reporting week, this weight is equal to the ratio of the number of sampled shipments for the reporting week to the number of "usable" shipments for the same week. The shipment weight and shipment nonresponse weight for certainty shipments from a particular establishment's reporting week are both equal to one.

The quarter weight inflates an establishment's estimate for a particular reporting week to an estimate for the corresponding quarter. For noncertainty shipments, the quarter weight is equal to 13. The quarter weight for most certainty shipments is also equal to 13. However, if a respondent is able to provide information about all large (or certainty) shipments made in the quarter containing the reporting week, then the quarter weight for each of these shipments would be one. For each establishment, the quarterly estimates are added to produce an estimate of the establishment's value of shipments for the entire survey year. Whenever an establishment does not provide the Census Bureau with a response for each of its four reporting weeks, we compute a quarter nonresponse weight. The quarter nonresponse weight for a particular establishment is defined as the ratio of the number of

quarters for which the establishment was in business in the survey year to the total number of quarters (reporting weeks) for which we received usable shipment data from the establishment.

Using these four component weights, we compute an estimate of each establishment's value of shipments for the entire survey year. We then multiply this estimate by a weight that adjusts the estimate using value of shipments and sales data obtained from other Census Bureau surveys and preliminary results of the 1997 Economic Census. This weight, called the establishment-level adjustment weight, attempts to correct for any sampling or nonsampling errors that occur during the sampling of shipments by the respondent.

The adjusted value of shipments estimate for an establishment is then weighted by the establishment weight. This weight is equal to the inverse of the establishment's probability of being selected into the sample.

A final adjustment weight, called the SIC-level adjustment weight, uses preliminary results of the 1997 Economic Census to account for establishments from which we did not receive a response (including establishments from which we did not receive any usable shipment data) and for changes in the population of establishments between the time the first-stage sampling frame was constructed (1995) and the year in which the data were collected (1997). Separate SIC-level adjustment weights are determined for nonauxiliary and auxiliary establishments.

Appendix D.

Standard Classification of Transported Goods Code Information

The commodities shown in this report are classified using the Standard Classification of Transported Goods (SCTG) coding system. The SCTG coding system was created jointly by agencies of the United States and Canadian governments based on the Harmonized System (HS) of product classification which is used worldwide. The purpose of the SCTG coding system was to specifically address statistical needs in regard to products transported.

In the past, Commodity Flow Survey (CFS) data have been collected and reported using product classifications found in the Standard Transportation Commodity Classification (STCC) system. These classifications were developed in the early 1960s by the American Association of Railroads (AAR) to analyze commodity movements by rail. The original purpose of the STCC was for identification of commodities for purposes of assigning rates for Interstate Commerce Commission (ICC) regulated rail carriers. The STCC continues to be used by the AAR as a tariff mechanism.

At the time that the Commodity Transportation Survey (CTS) (the CTS—the predecessor of the CFS) was first conducted in 1963, STCC codes were still useful for analyzing most important aspects of the U.S. transportation system. Since then, many changes have taken place that have gradually made the STCC code less useful for tracking domestic product movements across all modes (although

it remains perfectly functional for tracking rail-only movements). These include the deregulation of trucking, the enactment of North American Free Trade Agreement (NAFTA), changes in logistics practices, the emergence of plastics and composite materials to replace metals and glass, the obsolescence of many categories of wood products, and the very rapid recent development of high-tech electronic goods. Because the CFS is a shipper survey, the CFS collects information about shipments moving on all modes. As a consequence, STCC classifications frequently provide inadequate detail for identifying products that are significant for modes, such as truck and air. It is for these reasons that the Bureau of Transportation Statistics (BTS) has sponsored the development of a new product code to collect and report CFS data.

In 1997 the CFS provided respondents with a listing of SCTG codes and descriptions at the five-digit level to use in assigning a commodity code for each shipment. For shipments of more than one commodity, we instructed respondents to use the five-digit code for the major commodity, defined as the commodity of greatest total weight in the shipment.

Additional information on the SCTG system can be found on the Internet through the BTS web page at <http://www.bts.gov>. Comments or questions on the SCTG should be directed to [http://cfs@bts.gov](mailto:cfs@bts.gov).

Appendix E.

Sample Report Forms and Instructions

The sample report forms and instructions are shown on the following pages.

Note: The CFS-2000 was sent to a subsample of establishments to obtain additional information about the use of transportation equipment and facilities.

**1997 COMMODITY FLOW SURVEY
CENSUS OF TRANSPORTATION**

Reporting period:

Please return by:

RETURN TO

**BUREAU OF THE CENSUS
1201 East 10th Street
Jeffersonville IN 47132-0001**

(Please correct any error in name, address, and ZIP Code)

BEFORE COMPLETING YOUR REPORT, please read the accompanying instruction guide. If book figures are not available for requested data, please provide estimates. If you have any questions, please call 1-800-772-7851.

Through this survey, we are requesting data on a representative sample of your outbound shipments, to help us produce key statistics used by transportation planners and managers. We greatly appreciate your assistance in this program.

Item A Is the establishment name shown in the mailing address correct?

- 1 Yes
- 2 No — *Enter correct name.* ↗

Item B Mark (X) the **ONE** box which best describes this establishment during the one-week period shown above.

- 1 In operation
- 2 Temporarily or seasonally inactive
- 3 Ceased operation — *Give date* →

Month	Day	Year

Item C Is this establishment's physical location the same as the address shown in the label? (PO boxes or rural routes are not physical locations.)

- 1 Yes
- 2 No — *Enter physical location below.* ↗

Number and street

City, town, village, etc.

State

ZIP Code

NOTE — The rest of this questionnaire requests information about shipments (or deliveries) from the establishment located at the address in the mailing label.

If you entered a different address in item C — *Please complete the form for shipments originating from the location listed in item C.*

Item D Please enter the **total number** of outbound shipments (or deliveries), including customer pick-up, for the one-week reporting period shown above. If book figures are not available, please provide your best estimate.

This number should reflect all shipments and deliveries leaving this location during the one-week reporting period. *Please see Instruction Guide for a definition of "shipment."*



DO NOT PROCEED UNTIL YOU HAVE COMPLETED ITEM D.



YOUR RESPONSE IS REQUIRED BY LAW. Title 13, United States Code, requires businesses and other organizations that receive this questionnaire to answer the questions and return the report to the Census Bureau. By the same law, **YOUR CENSUS REPORT IS CONFIDENTIAL.** It may be seen only by Census Bureau employees and may be used only for statistical purposes. Further, copies retained in respondents' files are immune from legal process.

Item E SAMPLING INSTRUCTIONS

Our goal in this section is to identify a sample of your shipments that you will provide data on. Through the use of a sample, we can avoid asking you for information on all of your shipments, while still obtaining statistically accurate information.

FINDING YOUR SELECTION RATE

If you reported 40 or fewer shipments in item D, please enter "1" as your selection rate in the box below, then go directly to item F and enter the information for each of your shipments.

If you reported 41 or more shipments in item D, we will now ask you to select and report on a sample of your shipments. Following the steps below will result in a sample of 20 to 40 shipments to report on in item F.

In the table at right, identify the selection rate that corresponds to the number you entered in item D, and enter it in the box below.

Please enter your selection rate. →

Number of shipments entered in item D	Selection rate
1— 40	1
41— 80	2
81— 100	3
101— 200	5
201— 400	10
401— 800	20
801— 1600	40
1601— 3200	80
3201— 6400	160
6401— 12800	320
More than 12800	Call Census at 1-800-772-7851

CONTINUE ON NEXT PAGE. ↗

Item F SHIPMENT CHARACTERISTICS

Line No. (a)	Shipment ID Number (b)	Shipment date (c)		Shipment value (excluding shipping costs) in whole dollars (d)	Shipment weight in pounds (e)	Commodity code from SCTG Manual (f)	Commodity description (g)	If a hazardous material, enter the "UN" or "NA" number (h)
		Month	Day					
0	123-5	4	26	4,235	140	3 5 1 2 0	Electrical transformers	
00	402H	4	26	125,300	626,500	1 7 1 0 0	Gasoline	1 2 0 3
1								
2								
3								
4								
5								
6								
7								
8								
9								

Mode of transport codes for columns (k) and (n) ▶

1 — Parcel delivery, courier, or U.S. Postal Service

2 — Private truck
3 — For-hire truck

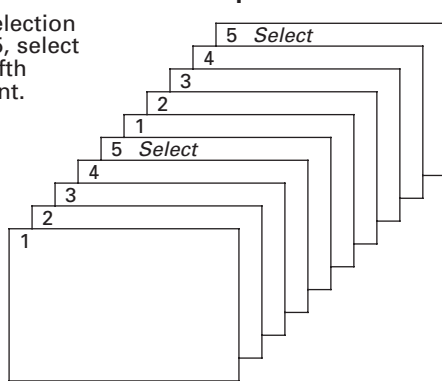
4 — Railroad
Continued →

SELECTING YOUR SAMPLE OF SHIPMENTS

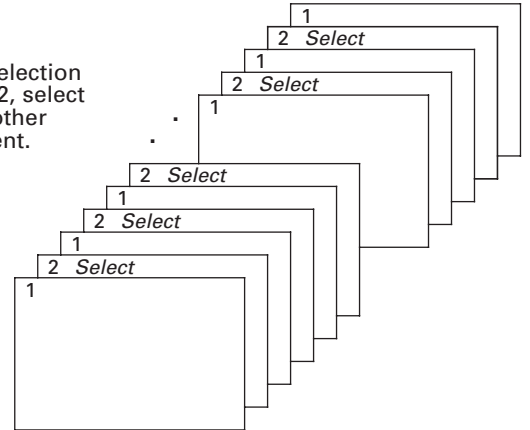
1. Use the file or combination of files that best reflects your full range of outbound shipping activities.
2. Begin with the first shipment. Count the shipments until you reach your selection rate. Select this shipment to report on in item F.
3. Continue counting with the next shipment. Count this shipment as 1 and continue until you reach the selection rate again. Select this shipment to report on in item F.
4. Repeat step 3 until you reach the last shipment for the one-week period. If the last shipment is counted as the selection rate, select this shipment to report on in item F. If the last shipment is not counted as the selection rate, do not report this shipment.

In the following examples, each rectangle represents one shipment.

If the selection rate is 5, select every fifth shipment.



If the selection rate is 2, select every other shipment.



Once you have selected your sample of shipments, please proceed to item F and enter the requested information for each selected shipment. Examples of completed lines for two shipments are provided on lines "0" and "00" below.

If you have difficulties constructing a file of shipments or have questions about how to select the sample of your shipments, please call our toll-free number for assistance: 1-800-772-7851.

Containerized? (Y/N)	U.S. destination <i>(Complete for all shipments.)</i>			Mode(s) of transport to U.S. destination <i>Enter all that apply in order used. Use codes below.</i>	Export? (Y/N)	Foreign destination <i>(for export shipments only)</i> Note: In column (j) enter the U.S. port, airport, or border crossing of exit.		Export mode	Line No.
	(i)	(j)				(k)	(l)		
	City	State	ZIP Code			City	Country		
N	Los Angeles	C A	9 0 0 4 0	2, 4, 3	N				0
N	New York	N Y	1 0 4 5 4	5	Y	London	England	6	00
									1
									2
									3
									4
									5
									6
									7
									8
									9

5 — Shallow draft vessel 7 — Pipeline 9 — Other mode
 6 — Deep draft vessel 8 — Air 0 — Unknown

Item F SHIPMENT CHARACTERISTICS — Continued

Line No. (a)	Shipment ID Number (b)	Shipment date (c)		Shipment value (excluding shipping costs) in whole dollars (d)	Shipment weight in pounds (e)	Commodity code from SCTG Manual (f)	Commodity description (g)	If a hazardous material, enter the "UN" or "NA" number (h)
		Month	Day					
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								

Mode of transport codes for columns (k) and (n)

1 — Parcel delivery, courier, or U.S. Postal Service

2 — Private truck
3 — For-hire truck

4 — Railroad
Continued →

Containerized? (Y/N)	U.S. destination <i>(Complete for all shipments.)</i>			Mode(s) of transport to U.S. destination <i>Enter all that apply in order used. Use codes below.</i>	Export? (Y/N)	Foreign destination <i>(for export shipments only)</i>		Export mode	Line No.
	(j)					(m)			
(i)	City	State	ZIP Code	(k)	(l)	City	Country	(n)	(o)
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25
									26
									27
									28
									29
									30
									31
									32
									33
									34

5 — Shallow draft vessel
6 — Deep draft vessel

7 — Pipeline
8 — Air

9 — Other mode
0 — Unknown

Item F SHIPMENT CHARACTERISTICS — Continued

Line No. (a)	Shipment ID Number (b)	Shipment date (c)		Shipment value (excluding shipping costs) in whole dollars (d)	Shipment weight in pounds (e)	Commodity code from SCTG Manual (f)	Commodity description (g)	If a hazardous material, enter the "UN" or "NA" number (h)
		Month	Day					
35								
36								
37								
38								
39								
40								

Mode of transport codes for columns (k) and (n) **1** — Parcel delivery, courier, or U.S. Postal Service **2** — Private truck **3** — For-hire truck **4** — Railroad *Continued* →

Item G

1. Do this establishment's outbound shipments leave more than one site within this physical location?

Yes

No

2. Are the records for outbound shipments from this location maintained in a number of separate files (e.g., separate files for each commodity, or for each shipping site) at this location?

Yes

No

If yes to item G1 or item G2:

3. Would it be easier to receive a separate questionnaire for each file or each shipment site?

Yes

No

Item H Enter the total value of shipments for the one-week reporting period. This figure should represent all products leaving this establishment for the one-week period. An estimate is acceptable.

Total value in whole dollars

Item I In the last three months did this location have any individual shipments with a value over \$2,000,000?

Yes

No

Item J CERTIFICATION

Name of person to contact regarding this report — <i>Please print</i>	Telephone number — <i>Include area code</i>	Date
Signature	Title	

Containerized? (Y/N)	U.S. destination (Complete for all shipments.)			Mode(s) of transport to U.S. destination <i>Enter all that apply in order used. Use codes below.</i>	Export? (Y/N)	Foreign destination (for export shipments only) Note: In column (j) enter the U.S. port, airport, or border crossing of exit.		Export mode	Line No.
	(j)					(m)			
(i)	City	State	ZIP Code	(k)	(l)	City	Country	(n)	(o)
									35
									36
									37
									38
									39
									40

- 5** — Shallow draft vessel **7** — Pipeline **9** — Other mode
6 — Deep draft vessel **8** — Air **0** — Unknown

Remarks

THANK YOU FOR COMPLETING YOUR REPORT

**1997 COMMODITY FLOW SURVEY
CENSUS OF TRANSPORTATION**

Reporting period:

Please return by:

RETURN TO
▼
BUREAU OF THE CENSUS
1201 East 10th Street
Jeffersonville IN 47132-0001

(Please correct any error in name, address, and ZIP Code)

BEFORE COMPLETING YOUR REPORT, please read the accompanying instruction guide. If book figures are not available for requested data, please provide estimates. If you have any questions, please call 1-800-772-7851.

Through this survey, we are requesting data on a representative sample of your outbound shipments, to help us produce key statistics used by transportation planners and managers. We greatly appreciate your assistance in this program.

Item C Is this establishment's physical location the same as the address shown in the label? (PO boxes or rural routes are not physical locations.)

- 1 Yes
- 2 No — *Enter physical location below.* ↗

Number and street		
City, town, village, etc.	State	ZIP Code

NOTE — The rest of this questionnaire requests information about shipments (or deliveries) from the establishment located at the address in the mailing label.

If you entered a different address in item C — *Please complete the form for shipments originating from the location listed in item C.*

Item D Please enter the **total number** of outbound shipments (or deliveries), including customer pick-up, for the one-week reporting period shown above. If book figures are not available, please provide your best estimate.

	This number should reflect all shipments and deliveries leaving this location during the one-week reporting period. <i>Please see Instruction Guide for a definition of "shipment."</i>
--	---

Item A Is the establishment name shown in the mailing address correct?

- 1 Yes
- 2 No — *Enter correct name.* ↗

Item B Mark (X) the **ONE** box which best describes this establishment during the one-week period shown above.

- 1 In operation
- 2 Temporarily or seasonally inactive
- 3 Ceased operation — *Give date* →

Month	Day	Year

DO NOT PROCEED UNTIL YOU HAVE COMPLETED ITEM D.

YOUR RESPONSE IS REQUIRED BY LAW. Title 13, United States Code, requires businesses and other organizations that receive this questionnaire to answer the questions and return the report to the Census Bureau. By the same law, **YOUR CENSUS REPORT IS CONFIDENTIAL.** It may be seen only by Census Bureau employees and may be used only for statistical purposes. Further, copies retained in respondents' files are immune from legal process.

Item E SAMPLING INSTRUCTIONS

Our goal in this section is to identify a sample of your shipments that you will provide data on. Through the use of a sample, we can avoid asking you for information on all of your shipments, while still obtaining statistically accurate information.

FINDING YOUR SELECTION RATE

If you reported 40 or fewer shipments in item D, please enter "1" as your selection rate in the box below, then go directly to item F and enter the information for each of your shipments.

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In the table at right, identify the selection rate that corresponds to the number you entered in item D, and enter it in the box below.

Please enter your selection rate. →

Number of shipments entered in item D	Selection rate
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41— 80	2
81— 100	3
101— 200	5
201— 400	10
401— 800	20
801— 1600	40
1601— 3200	80
3201— 6400	160
6401—12800	320
More than 12800	Call Census at 1-800-772-7851

CONTINUE ON NEXT PAGE. ↗

Item F SHIPMENT CHARACTERISTICS

Line No. (a)	Shipment ID Number (b)	Shipment date (c)		Shipment value (excluding shipping costs) in whole dollars (d)	Shipment weight in pounds (e)	Commodity code from SCTG Manual (f)	Commodity description (g)	If a hazardous material, enter the "UN" or "NA" number (h)
		Month	Day					
0	123-5	4	26	4,235	140	3 5 1 2 0	Electrical transformers	
00	402H	4	26	125,300	626,500	1 7 1 0 0	Gasoline	1 2 0 3
1								
2								
3								
4								
5								
6								
7								
8								
9								

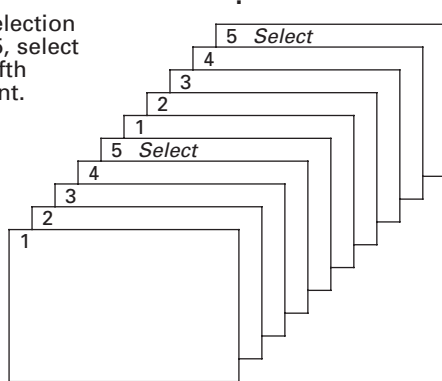
Mode of transport codes for columns (k) and (n) **1** — Parcel delivery, courier, or U.S. Postal Service **2** — Private truck **3** — For-hire truck **4** — Railroad
 Continued →

SELECTING YOUR SAMPLE OF SHIPMENTS

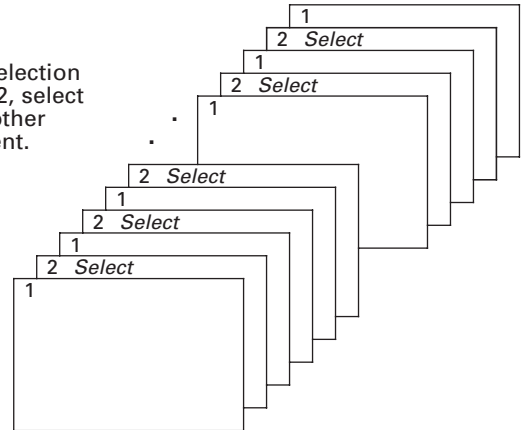
1. Use the file or combination of files that best reflects your full range of outbound shipping activities.
2. Begin with the first shipment. Count the shipments until you reach your selection rate. Select this shipment to report on in item F.
3. Continue counting with the next shipment. Count this shipment as 1 and continue until you reach the selection rate again. Select this shipment to report on in item F.
4. Repeat step 3 until you reach the last shipment for the one-week period. If the last shipment is counted as the selection rate, select this shipment to report on in item F. If the last shipment is not counted as the selection rate, do not report this shipment.

In the following examples, each rectangle represents one shipment.

If the selection rate is 5, select every fifth shipment.



If the selection rate is 2, select every other shipment.



Once you have selected your sample of shipments, please proceed to item F and enter the requested information for each selected shipment. Examples of completed lines for two shipments are provided on lines "0" and "00" below.

If you have difficulties constructing a file of shipments or have questions about how to select the sample of your shipments, please call our toll-free number for assistance: 1-800-772-7851.

Containerized? (Y/N)	U.S. destination <i>(Complete for all shipments.)</i>			Mode(s) of transport to U.S. destination <i>Enter all that apply in order used. Use codes below.</i>	Export? (Y/N)	Foreign destination (for export shipments only) Note: In column (j) enter the U.S. port, airport, or border crossing of exit.		Export mode	Line No.
	(i)	(j)				(k)	(l)		
	City	State	ZIP Code			City	Country		
N	Los Angeles	C A	9 0 0 4 0	2, 4, 3	N				0
N	New York	N Y	1 0 4 5 4	5	Y	London	England	6	00
									1
									2
									3
									4
									5
									6
									7
									8
									9

5 — Shallow draft vessel 7 — Pipeline 9 — Other mode
 6 — Deep draft vessel 8 — Air 0 — Unknown

Item F SHIPMENT CHARACTERISTICS — Continued

Line No. (a)	Shipment ID Number (b)	Shipment date (c)		Shipment value (excluding shipping costs) in whole dollars (d)	Shipment weight in pounds (e)	Commodity code from SCTG Manual (f)	Commodity description (g)	If a hazardous material, enter the "UN" or "NA" number (h)
		Month	Day					
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								

Mode of transport codes for columns (k) and (n) ▶

1 — Parcel delivery, courier, or U.S. Postal Service

2 — Private truck
3 — For-hire truck

4 — Railroad
Continued →

Containerized? (Y/N)	U.S. destination <i>(Complete for all shipments.)</i>			Mode(s) of transport to U.S. destination <i>Enter all that apply in order used. Use codes below.</i>	Export? (Y/N)	Foreign destination (for export shipments only) Note: In column (j) enter the U.S. port, airport, or border crossing of exit.		Export mode	Line No.
	(j)					(m)			
(i)	City	State	ZIP Code	(k)	(l)	City	Country	(n)	(o)
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25
									26
									27
									28
									29
									30
									31
									32
									33
									34

5 — Shallow draft vessel
6 — Deep draft vessel

7 — Pipeline
8 — Air

9 — Other mode
0 — Unknown

Item F SHIPMENT CHARACTERISTICS — Continued

Line No. (a)	Shipment ID Number (b)	Shipment date (c)		Shipment value (excluding shipping costs) in whole dollars (d)	Shipment weight in pounds (e)	Commodity code from SCTG Manual (f)	Commodity description (g)	If a hazardous material, enter the "UN" or "NA" number (h)
		Month	Day					
35								
36								
37								
38								
39								
40								

Mode of transport codes for columns (k) and (n)

1 — Parcel delivery, courier, or U.S. Postal Service

2 — Private truck
3 — For-hire truck

4 — Railroad
Continued →

Item G Enter the total dollar value of **all** shipments for the one-week reporting period. This figure should represent all products leaving this establishment for the one-week period. An estimate is acceptable.

Total value in whole dollars

Item H In the last three months did this location have any individual shipments with a value over \$2,000,000?

Yes

No

Item I AVAILABILITY AND USE OF ON-SITE SHIPPING FACILITIES

In column (b), check "Yes" or "No" for each type of shipping facility to indicate whether or not this type of facility existed **on-site** during 1997. For each "Yes" in column (b), check "Yes" or "No" in column (c) to indicate whether or not you used the facility on your premises for **outbound shipments** during 1997.

Type of shipping facility (a)	Was a shipping facility of this type on your premises during 1997? (b)	Did you use this facility on your premises for outbound shipments during 1997? (c)
1. Rail siding	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No
2. Dock on the Great Lakes	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No
3. Dock on inland water	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No
4. Dock on deep sea water	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No
5. Airport/landing strip capable of handling your shipments	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No
6. Pipeline terminal	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No

Containerized? (Y/N)	U.S. destination (Complete for all shipments.)			Mode(s) of transport to U.S. destination <i>Enter all that apply in order used. Use codes below.</i>	Export? (Y/N)	Foreign destination (for export shipments only) Note: In column (j) enter the U.S. port, airport, or border crossing of exit.		Export mode	Line No.
	(j)					(m)			
(i)	City	State	ZIP Code	(k)	(l)	City	Country	(n)	(o)
									35
									36
									37
									38
									39
									40

5 — Shallow draft vessel **7** — Pipeline **9** — Other mode
6 — Deep draft vessel **8** — Air **0** — Unknown

Item J USE OF OFF-SITE SHIPPING FACILITIES

In column (b), check "Yes" or "No" for each type of shipping facility to indicate whether or not you used an **off-site** facility of that type for **outbound shipments** during 1997. For each "Yes", enter the miles to that off-site facility in column (c), and the mode of transport used to reach that facility in column (d). The modes are listed below.

Type of shipping facility (a)	Did you use this type of off-site facility for outbound shipments during 1997? (b)	Distance to the off-site facility of this type that you used most in 1997 (Report in miles – estimates are acceptable) (c)	Mode of transport used to reach that facility (Enter a code from the list below) (d)
1. Rail siding	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No		
2. Dock on the Great Lakes	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No		
3. Dock on inland water	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No		
4. Dock on deep sea water	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No		
5. Airport/landing strip capable of handling your shipments	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No		
6. Pipeline terminal	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No		

1 – Trailer on Flat Car (TOFC) **3** – For-Hire Truck **5** – Water **7** – Air
2 – Private Truck **4** – Rail **6** – Pipeline **8** – Other

PLEASE CONTINUE ON PAGE 8.

Item K USE AND AVAILABILITY OF TRANSPORTATION EQUIPMENT

During 1997, did this location use any of the following types of equipment for outbound shipments? Please check "Yes" or "No." For rail cars reported in number 1 below, enter the approximate percentage of your total outbound rail shipments that used that type of rail car. These percentages should add to 100%. If you had no rail shipments, leave the percentages blank.

Equipment (a)	Was this type of equipment used for outbound shipments during 1993? (b)	Percentage of total rail shipments (c)
1. Rail cars that: a. Your company owned/leased	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No	
b. A common carrier owned/leased	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No	
c. Another party owned/leased (e.g. receiver)	1 <input type="checkbox"/> Yes → 2 <input type="checkbox"/> No	
2. Trucks with 6 or more tires or truck-tractors that: a. Your company owned	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	
b. Your company leased, with driver	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	
c. Your company leased, without driver	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	
3. Truck trailers that your company owned or leased	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	
4. Aircraft that your company owned or leased	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	
5. Barges that your company owned or leased	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	
6. Other equipment that your company owned or leased – Specify ↕	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	

Item L TRANSPORTATION DECISIONS

During 1997, who generally decided on the mode of transportation for your outbound shipments? Check the appropriate box.

- 1 Your company 2 Receiver of shipment 3 Other

Remarks

Item M CERTIFICATION

Name of person to contact regarding this report – Please print	Telephone number – Include area code	Date
Signature	Title	

Instructions for Completing the Commodity Flow Survey

TIPS FOR COMPLETING THE CFS QUESTIONNAIRE

Please read all instructions.

You may use estimates if book figures are not readily available.

If you have questions about completing the survey, a Census Bureau representative will be glad to assist you. You can call us at 1-800-772-7851.

Some instructions are included on the questionnaire itself. However, due to space limitations, most of the instructions and definitions are included in separate reference materials. These include this instruction guide, and a listing of commodity codes to be used for classifying individual shipments in this survey.

PART I – GENERAL INFORMATION
Frequently Asked Questions About the
Commodity Flow Survey (CFS)

Why are you conducting the CFS?

The CFS produces valuable measures of the demands on the nation's transportation system.

The results of the CFS are used by transportation policy makers to analyze future transportation needs.

Who reports in the CFS?

The CFS covers a sample of establishments in the mining, manufacturing, wholesale, and selected retail industries.

Why is my participation important?

Your establishment was selected as part of a sample designed to represent a wide range of industries and geographic regions.

Your report helps ensure quality results.

Is this survey mandatory?

Yes. The CFS is mandatory under the authority of Title 13, United States Code (USC).

Will my data be kept confidential?

Yes. The same law that requires your participation, Title 13, USC, also guarantees your data will be kept strictly confidential.

The reports you provide the Census Bureau cannot be used for purposes of taxation, regulation, or investigation.

Your report is used only to develop summary data that do not reveal the activities of individual firms or establishments.

How often must I report?

You will be sent four questionnaires in all: one during each quarter of 1997.

The CFS will not be conducted again until 2002.

PART II – INSTRUCTIONS FOR COMPLETING YOUR QUESTIONNAIRE

Items A – C

Please enter the information requested on your establishment's name, operational status, and physical location.

Item D

Enter in the space provided your total number of outbound shipments **for the one week reporting period** on the front of the questionnaire.

Please include in this count any materials picked up by the customer ("customer pick-up").

What we mean by a "shipment":

For the purposes of this survey, a shipment is a single movement of goods, commodities, products, etc. from your location to a customer or to another location of your company.

"Commodities" refer to items that your location produces, sells, or distributes, *not* to items that are considered by-products of your location's operation.

What we don't mean by a "shipment":

Do *not* include as shipments items such as inter-office memos, payroll checks, business correspondence, etc.

Do *not* include as shipments items such as refuse, scrap paper, waste, and recyclable materials **unless** your location is in the business of selling or providing these materials to others.

A special note about "shipments":

A full, or partial, truckload should be counted as a single shipment only if all the commodities on the truck are destined for one location.

If a truck makes multiple deliveries on a route, **please count each stop as one shipment.**

Item E: Sampling Instructions

If you reported 40 or fewer shipments in Item D, complete Item F (Shipment Characteristics) for all of your shipments covered by the one-week reporting period.

If you reported more than 40 shipments in Item D, follow the instructions in Item E in order to select a sample of shipments on which to report in Item F.

By asking you to select a sample of your shipments for the one-week reporting period, we avoid asking you for information on all your shipments, while still obtaining statistically accurate information.

Reminder: The files you are sampling from should reflect the full range of your location's shipping activities in terms of modes of transportation used, commodities shipped, and destinations.

We're here to answer your questions! If you have questions about the sampling process (or any part of the questionnaire) please call us at 1-800-772-7851.

PART II – INSTRUCTIONS FOR COMPLETING YOUR QUESTIONNAIRE – Continued

Item F: Shipment Characteristics

- **Shipment ID Number (column b)** – Enter the invoice number, shipment number, or some other unique identification number that your establishment could use to find this particular shipping document if questions arise regarding your report.
- **Shipment Date (column c)** – Enter the month and day of the shipment. If shipment date is not available, use the invoice/shipping document date. Use numbers only.
- **Shipment Value (column d)** – Enter the dollar value, in whole dollars, of the entire shipment. The value should not include freight charges or excise taxes (i.e., report the net selling value, f.o.b. plant). If the value is not readily available from your records, please estimate.
- **Shipment Weight (column e)** – Enter the weight of the total shipment in whole pounds. If weight is not readily available from your records, please estimate.
- **Commodity Code (column f)** – Please use the list of Standard Classification of Transported Goods (SCTG) Codes in the enclosed SCTG Manual to select the proper code. For shipments with more than one commodity, enter only the code for the commodity with the greatest weight.
- **Commodity Description (column g)** – Enter a brief description of the commodity shipped. For shipments with more than one commodity, describe only the commodity with the greatest weight. Do not use trade names, catalog numbers, or other codes not familiar to persons outside your business.

Item F SHIPMENT CHARACTERISTICS							
Line No.	Shipment ID Number	Shipment date		Shipment value (excluding shipping costs) in whole dollars	Shipment weight in pounds	Commodity code from SCTG Manual	Commodity description
		Month	Day				
(a)	(b)	(c)	(c)	(d)	(e)	(f)	(g)
0	123-5	4	26	4,235	140	3 6 1 2 0	Electrical transformers
00	123-6	4	26	125,300	626,500	1 7 1 0 0	Gasoline
1							
2							
3							
4							

Mode of transport codes for columns (k) and (n) ▶	1 — Parcel delivery, courier, or U.S. Postal Service	2 — Private truck 3 — For-hire truck	4 — Railroad Continued →
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PART II – INSTRUCTIONS FOR COMPLETING YOUR QUESTIONNAIRE – Continued

Item F: Shipment Characteristics – Continued

- **For Hazardous Materials (column h)** – If shipment is a hazardous material, enter the 4-digit United Nations or North American number.
- **Containerized (column i)** – Indicate whether or not the shipment was containerized by entering "Y" or "N" (yes or no). Containerized means that the shipment **left your establishment** in an intermodal container or stackable tank without permanently attached wheels. These containers typically vary from 20 to 53 feet in length, and are carried on truck chassis, trains, and ships.
- **U.S. Destination: City, State, and ZIP Code (column j)** – For domestic shipments, enter the city, state, and 5-digit ZIP Code of the buyer/receiver as it appears on the shipping document. Use the **"ship to"** address. Use the two letter state abbreviation shown in Part IV.

For **export shipments**, report the U.S. **port of exit** as the destination city. The port of exit is the port or airport from which the shipment left the country. In case of land shipments into Mexico or Canada, it is the border crossing.
- **Mode(s) of Transport (column k)** – Enter the code(s) for **all** modes of transport used for the shipment to its U.S. destination (i.e., the destination reported in column j). Codes are located on the bottom of pages 2, 3, 4, and 5 of the questionnaire. Enter in the sequence used, all that apply. See Part III for definitions of each mode.
 - **For Customer Pick-up:** Report the mode(s) of transportation used, if known. Otherwise, report mode as "0" (unknown).
 - **For Export Shipments:** List only the mode(s) of transport used to reach the port, airport, or border crossing of exit.

If a hazardous material, enter the "UN" or "NA" number (h)	Containerized? (Y/N) (i)	U.S. destination (j)			Mode(s) of transport to U.S. destination <i>Enter all that apply using codes shown below.</i> (k)
		City	State	ZIP Code	
	N	Los Angeles	C A	9 0 0 4 0	2, 4, 3
	N	New York	N Y	1 0 4 5 4	5

PART II – INSTRUCTIONS FOR COMPLETING YOUR QUESTIONNAIRE – Continued

Item F: Shipment Characteristics – Continued

- **Export Shipment (column l)** – Indicate whether or not the shipment is intended for export outside of the United States, by entering a "Y" or "N" (yes or no). For purposes of this survey, shipments to Puerto Rico and U.S. territories and possessions are considered exports.
- **Foreign Destination: City and Country (column m)** – If the shipment is an export, enter the foreign city and country of destination. **For U.S. Destination (column j),** enter the U.S. port, airport, or border crossing of exit. **In column (k),** enter the mode of transport used to the U.S. destination.
- **Export Mode (column n)** – If the shipment is an export, enter the code for the mode of transport by which the shipment left the country. Codes are located at the bottom of pages 2, 3, 4, and 5 of the questionnaire.

Export? (Y/N) (l)	Foreign destination (for export shipments only) Note: In column (j) enter the U.S. port, airport, or border crossing of exit. (m)		Export mode (n)	Line No. (o)
	City	Country		
N				0
Y	London	England	6	00
				1
				2
				3
				4
				5

Items G – I

Please enter the information requested.

Item J: Certification

Please enter the name and telephone number of the person to contact in the event that we have a question about your report.

PART III – MODE DEFINITIONS

Parcel delivery/Courier/U.S. Postal Service – Delivery services that carry letters, parcels, packages, and other small shipments that typically weigh less than 100 pounds. Includes bus parcel delivery service.

Private truck – Trucks operated by a temporary or permanent employee of this establishment or the buyer/receiver of the shipment.

For-hire truck – Trucks that carry freight for a fee collected from the shipper, recipient of the shipment, or an arranger of the transportation.

Railroad – Any common carrier or private railroad.

Shallow draft vessel – Barges, ships, or ferries operating primarily on rivers and canals; in harbors, the Great Lakes, the Saint Lawrence Seaway; the Intracoastal Waterway, the Inside Passage to Alaska, major bays and inlets; or in the ocean close to the shoreline.

Deep draft vessel – Barges, ships, or ferries operating primarily in the open ocean. Shipping on the Great Lakes and the Saint Lawrence Seaway is classified with shallow draft vessels.

Pipeline – Movements of oil, petroleum, gas, slurry, etc. through pipelines that extend to other establishments or locations beyond the shipper's establishment. Aqueducts for the movement of water are not included.

Air – Commercial or private aircraft, and all air service for shipments that typically weigh more than 100 pounds. Includes air freight and air express.

Other mode – Any mode not listed above.

Unknown – The shipment was not carried by a parcel delivery/courier/U.S. Postal service, and you cannot determine what mode of transportation is used.

Note: Commodities that are "shipped" under their own power, such as boats, barges, ferries, ships, aircraft, trucks, and trains **should be classified with the appropriate mode above.** Commodities shipped under their own power for which an appropriate mode is not listed (e.g., buses, recreational vehicles) should be listed as **"other" mode.**

PART IV -- STATE ABBREVIATION LIST

State	Abbrev.	State	Abbrev.
Alabama	AL	Montana	MT
Alaska	AK	Nebraska	NE
Arizona	AZ	Nevada	NV
Arkansas	AR	New Hampshire	NH
California	CA	New Jersey	NJ
Colorado	CO	New Mexico	NM
Connecticut	CT	New York	NY
Delaware	DE	North Carolina	NC
Dist. of Col.	DC	North Dakota	ND
Florida	FL	Ohio	OH
Georgia	GA	Oklahoma	OK
Hawaii	HI	Oregon	OR
Idaho	ID	Pennsylvania	PA
Illinois	IL	Rhode Island	RI
Indiana	IN	South Carolina	SC
Iowa	IA	South Dakota	SD
Kansas	KS	Tennessee	TN
Kentucky	KY	Texas	TX
Louisiana	LA	Utah	UT
Maine	ME	Vermont	VT
Maryland	MD	Virginia	VA
Massachusetts	MA	Washington	WA
Michigan	MI	West Virginia	WV
Minnesota	MN	Wisconsin	WI
Mississippi	MS	Wyoming	WY
Missouri	MO		

NOTICE - We estimate that it will take an average of 2 hours to complete this form. This includes time to read instructions, assemble and review information, and record answers on the form. If you have any comments regarding this estimate or any other aspect of this survey, send them to the Associate Director for Administration, Attn: Paperwork Reduction Project 0607-0189, Room 3104, Federal Building 3, Bureau of the Census, Washington, DC 20233-0001. Respondents are not required to respond to any information collection unless it displays a valid approval number in the top right corner on the front of the questionnaire.

