United States
2017 Economic Census: Transportation

2017 Commodity Flow Survey

Issued September 2020
EC17TCF-US

U.S. Department of Transportation
BUREAU OF TRANSPORTATION STATISTICS
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U.S. Department of Transportation
Elaine L. Chao,
Secretary

Steven G. Bradburry,
Performing the functions and duties of the Deputy Secretary

Office of the Assistant Secretary for Research and Technology
Diana Furchtgott-Roth,
Deputy Assistant Secretary

BUREAU OF TRANSPORTATION STATISTICS
Patricia S. Hu,
Director

U.S. Department of Commerce
Wilbur Ross,
Secretary

Karen Dunn Kelley,
Deputy Secretary

U.S. CENSUS BUREAU
Steven Dillingham,
Director

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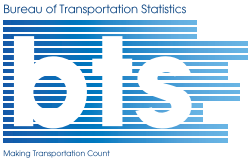

BUREAU OF TRANSPORTATION STATISTICS

Patricia S. Hu,
Director

Dr. Rolf Schmitt,
Deputy Director

U.S. CENSUS BUREAU

Steven Dillingham,
Director

Ron S. Jarmin,
Deputy Director and Chief Operating Officer

Nicholas Orsini,
Associate Director for Economic Programs

Samuel Jones,
Assistant Director for Economic Programs

Kevin Deardorff,
Chief, Economic Reimbursable Surveys Division

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Jessica M. Young and **Erika McDonald**, Commodity Flow Survey Branch, Economic Reimbursable Surveys Division, prepared this publication led by **Berin Linfors**, Chief, Commodity Flow Survey Branch.

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For additional information regarding data in this publication, visit <www.census.gov/programs-surveys/cfs.html>.

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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 function of the nation's economy. It provides essential information for government, business, industry, and the general public. Title 13 of the U.S. Code (Sections 131, 191, and 224) directs the U.S. Census Bureau to take the Economic Census every 5 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, ship, 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

All results of the 2017 Economic Census are available on data.census.gov. The Web site allows selective retrieval and downloading of the data. For more information, including a description of reports being issued, visit <www.census.gov/programs-surveys/economic-census/about/contact-us.html>.

HISTORICAL INFORMATION

The Economic Census has been conducted as an integrated program at 5-year intervals since 1967 and before that in 1954, 1958, and 1963. Prior to that time, individual components of the Economic Census were collected 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 Census of Manufactures was the first time a census other than the decennial population count was conducted. Censuses covering retail and wholesale trade and construction industries were added in 1930, as were some 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 and 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 have also been used to provide basic statistics for very small firms, reducing or eliminating the need to send them census report forms.

The range of industries covered in the Economic Censuses expanded between 1967 and 2007. 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 expanded to include all of transportation, communications, and utilities. Coverage of financial, insurance, and real estate industries was also added in 1992. 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. In 2002, there was new coverage of the following four industries classified in the Agriculture, Forestry, and Fishing sector under the Standard Industrial Classification (SIC) system: landscape agricultural services, landscaping services, veterinary services, and pet care services.

SOURCES FOR MORE INFORMATION

More information about scope, coverage, and classification system for each Economic Census and related surveys is published in the "What's New for 2017" section of the 2017 Economic Census Web site at <www.census.gov/programs-surveys/economic-census/news-updates/whats-new.html>.

Data items and publications for each Economic Census and related surveys are published as part of the 2017 Economic Census on data.census.gov. More information on the methodology, procedures, and history of each Economic Census is published in the "Methodology" section of the 2017 Economic Census Web site at <www.census.gov/programs-surveys/economic-census/technical-documentation/methodology.html>.

2017 CFS Methodology

OVERVIEW

The Commodity Flow Survey (CFS) is a joint effort by the Bureau of Transportation Statistics (BTS), U.S. Department of Transportation, and the U.S. Census Bureau, U.S. Department of Commerce. The survey is the primary source of national and subnational level (state and metropolitan area) data on domestic freight shipments by establishments in mining, manufacturing, wholesale, auxiliaries, and selected retail and services trade industries located in the 50 states and the District of Columbia. See the "First Stage—Establishment Selection" section for a more precise description of a metropolitan area. Data are provided on the type, origin and destination, value, weight, modes of transportation, distance shipped, and ton-miles of commodities shipped. The CFS is conducted every 5 years as part of the Economic Census. It provides a modal picture of national freight flows, and represents the only publicly available source of commodity flow data for the highway mode. The CFS was conducted in 1993, 1997, 2002, 2007, 2012, and 2017.

CFS data are used by policymakers and transportation professionals in various federal, state, and local agencies for assessing the demand for transportation facilities and services, energy use, and safety risk and environmental concerns. Additionally, business owners, private researchers, and analysts use the CFS data for analyzing trends in the movement of goods, mapping spatial patterns of commodity and vehicle flows, forecasting demands for the movement of goods, and determining needs for associated infrastructure and equipment.

OBJECTIVES

The primary objective of the 2017 CFS was to estimate shipping volumes (value, tons, and ton-miles) by commodity and mode of transportation at various levels of geographic detail. Another objective was to estimate the volume of shipments moving from one geographic area to another (i.e., flows of commodities between states, regions, etc.) by mode and commodity. A detailed description of the survey coverage and sample design of the 2017 CFS is provided below.

INDUSTRY COVERAGE

The 2017 CFS covers business establishments with paid employees that are located in the United States and are classified using the 2012 North American Industry Classification System (NAICS) in mining, manufacturing, wholesale, and selected retail and services trade industries, namely, electronic shopping and mail-order houses, fuel dealers, and publishers. Additionally, the survey covers auxiliary establishments (i.e., warehouses and managing offices) of multi-establishment companies.

Advance Survey

For the 2017 CFS, a targeted Advance Survey was conducted in 2016 to improve the quality of the data on the frame for certain industries or types of establishments. See Table 1 for the groups included in this Advance Survey.

Table 1.
2016 CFS Advance Survey Composition

Advance Survey group	Number of establishments
Auxiliaries (NAICS 484, 4931, and 551114)	40,280
Publishers (NAICS 5111 and 51223)	17,643
Electronic shopping mail order establishments (NAICS 4541)	31,746
Support activities for printing (NAICS 323120)	1,596
Mines (NAICS 2121, 2122, and 2123)	6,229
Certainty[1] establishments from the 2012 CFS	33,775
Other large establishments[2]	18,749
Total	150,018

[1] These are, generally, large establishments that were sampled with a probability of 1 in the 2012 CFS and so were likely to also be selected into the 2017 sample with certainty as well.

[2] These are establishments, not previously included in a group, whose measure of size (MOS) exceeded an industry specific cutoff. These were also likely to be selected into the 2017 sample with certainty.

For the first four groups in Table 1 (auxiliaries, publishers, electronic shopping, and support activities for printing), the purpose was to identify those establishments that actually conduct shipping activities. In these groups, surveyed establishments that reported they did not conduct any shipping activity were excluded from the eventual CFS sample universe. In these industries, approximately 38,000 establishments were identified as nonshippers and removed from the eventual sampling frame. For the other categories, the objective was to obtain an accurate measure of their shipping activity as well as contact information.

CFS Industries

In-scope industries for the 2017 CFS were selected based on the 2012 NAICS definitions. Industries included in the 2007 and 2012 CFS were selected based on the 2002 and 2007 versions of the NAICS, respectively. The industries in the 1997 CFS and the 1993 CFS were selected based on the 1987 Standard Industrial Classification System (SIC) and, although attempts were made to maintain similar coverage among the SIC based surveys (1993 and 1997) and the NAICS based surveys (2002, 2007, 2012, and 2017), there have been some changes in industry coverage

due to the conversion from SIC to NAICS. Most notably, coverage of the logging industry changed from an in-scope Manufacturing industry (SIC 2411) to the out-of-scope sector of Agriculture, Forestry, Fishing, and Hunting under NAICS 1133. Also, publishers were reclassified from Manufacturing (SIC 2711, 2721, 2731, 2741, and part of 2771) to Information (NAICS 5111 and 51223) and were excluded in the 2002 CFS. Subsequent surveys have included publishers as well as retail fuel dealers.

The (2012) NAICS industries covered in the 2017 CFS are listed in Table 2.

Excluded industries: Establishments classified in transportation (other than freight trucking and warehousing), construction, and most retail and services industries are excluded. These sectors have several million establishments in total and very few of these establishments are likely to have significant shipping activity. Including these sectors in the survey would have either: (1) reduced the quality of the data as large numbers of establishments would have been nonshippers, or (2) required a much greater sample size (and much greater cost). Other industry areas that are not covered, but may have significant shipping activity, include agriculture and government. These are out of scope for the Economic Census (after the Census of Agriculture was transferred to the Department of Agriculture) and the Census Bureau has no data on the shipping activity of individual establishments in these sectors. For agriculture, while the CFS does not cover shipments of agricultural products from the farm site to the processing centers or terminal elevators (generally short-distance local movements), it does cover the shipments of these products from the initial processing centers or terminal elevators onward.

General exclusions: Data for most government or military operated establishments are excluded from the CFS. The exceptions are government liquor wholesalers. The CFS also excludes establishments or firms with no paid employees and foreign establishments.

SHIPMENT COVERAGE

The CFS captures data on shipments originating from selected business establishments located in the 50 states and the District of Columbia. The CFS does not cover shipments originating from business establishments located in Puerto Rico and other U.S. possessions and territories.

Likewise, shipments traversing the United States 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 an initial U.S. location. However, imported products are included in the CFS from the point that they leave the importer's initial U.S. location (assuming it was an in-scope industry to the CFS) for shipment to another location. Shipments that are transported

Table 2.
NAICS In-Scope Industries to the 2017 CFS

NAICS code	Description
212	Mining (except oil and gas)
311	Food manufacturing
312	Beverage and tobacco product manufacturing
313	Textile mills
314	Textile product mills
315	Apparel manufacturing
316	Leather and allied product manufacturing
321	Wood product manufacturing
322	Paper manufacturing
323	Printing and related support activities
324	Petroleum and coal products manufacturing
325	Chemical manufacturing
326	Plastics and rubber products manufacturing
327	Nonmetallic mineral product manufacturing
331	Primary metal manufacturing
332	Fabricated metal product manufacturing
333	Machinery manufacturing
334	Computer and electronic product manufacturing
335	Electrical equipment, appliance, and component manufacturing
336	Transportation equipment manufacturing
337	Furniture and related product manufacturing
339	Miscellaneous manufacturing
4231[1]	Motor vehicle and parts merchant wholesalers
4232[1]	Furniture and home furnishing merchant wholesalers
4233[1]	Lumber and other construction materials merchant wholesalers
4234[1]	Commercial equipment merchant wholesalers
4235[1]	Metal and mineral (except petroleum) merchant wholesalers
4236[1]	Electrical and electronic goods merchant wholesalers
4237[1]	Hardware and plumbing merchant wholesalers
4238[1]	Machinery, equipment, and supplies merchant wholesalers
4239[1]	Miscellaneous durable goods merchant wholesalers
4241[1]	Paper and paper product merchant wholesalers
4242[1]	Drugs and druggists' sundries merchant wholesalers
4243[1]	Apparel, piece goods, and notions merchant wholesalers
4244[1]	Grocery and related product merchant wholesalers
4245[1]	Farm product raw material merchant wholesalers
4246[1]	Chemical and allied products merchant wholesalers
4247[1]	Petroleum and petroleum products merchant wholesalers
4248[1]	Beer, wine, and distilled alcoholic beverage merchant wholesalers
4249[1]	Miscellaneous nondurable goods merchant wholesalers
4541	Electronic shopping and mail-order houses
45431	Fuel dealers
4841[2]	General freight trucking
4842[2]	Specialized freight trucking
4931[2]	Warehousing and storage
5111	Newspaper, periodical, book, and directory publishers
51223	Music publishers
551114[3]	Corporate, subsidiary, and regional managing offices

[1] Wholesale establishments exclude manufacturers sales offices and own brand importers.
[2] Includes only captive warehouses that provide storage and shipping support to a single company. Warehouses offering their services to the general public and other businesses are excluded. For tabulation and publication purposes, NAICS 484 is grouped with NAICS 4931.
[3] Includes only those establishments in the industry with shipping activity as determined from the Advance Survey.

through a foreign territory with both the origin and destination in the United States are included in the CFS data. The mileages calculated for these shipments exclude the foreign country 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 U.S. port, airport, or border crossing of exit from the United States. See the "Mileage Calculation" section for additional detail on how mileage estimates were developed.

SAMPLE DESIGN

Overview

The sample for the 2017 CFS was selected using a three-stage design in which the first-stage sampling units were establishments, the second-stage sampling units were groups of four 1-week periods (reporting weeks) within the survey year, and the third-stage sampling units were shipments.

First Stage—Establishment Selection

To create the first-stage sampling frame, a subset of establishment records (as of July 2016) was extracted from the Census Bureau's Business Register. The Business Register is a database of all known establishments located in the United States and its territories. An establishment is a single physical location where business transactions take place or services are performed. Establishments located in the United States, having nonzero payroll in 2014 or 2015, (or 2016, for single-establishment companies), and classified in mining (except oil and gas extraction), manufacturing, wholesale, electronic shopping and mail order, fuel dealers, and publishing industries, as defined by the 2012 NAICS, were included on the sampling frame. Certain wholesalers (i.e., manufacturers' sales offices, agents, and brokers) and certain importers (i.e., own brand importers and marketers) were excluded from the frame. These wholesalers do not maintain inventory at their office location but rather arrange for products to be shipped to a buyer from some other location.

Auxiliary establishments (e.g. truck transportation facilities, warehouses, and central administrative offices) with shipping activity were also included on the sampling frame. Auxiliary establishments are establishments that are primarily involved in rendering support services to other establishments within the same company, instead of for the public, government, or other business firms. All other establishments included on the sampling frame are referred to as nonauxiliary establishments.

As described in the "CFS Industries" section, establishments classified in forestry, fishing, utilities, construction, and all other transportation, retail, and services industries were not included on the sampling frame. Farms and government-owned entities (except government-owned liquor wholesalers) were also excluded. For 2017, the resulting frame comprised approximately 710,500 establishments as summarized in Table 3.

Table 3.
CFS Frame Summary Statistics

Trade area	Establishments on the CFS frame		
	2017 CFS	2012 CFS	2007 CFS
Mining	6,065	6,543	6,789
Manufacturing	288,180	305,805	327,826
Wholesale	339,870	345,511	356,477
Retail	40,370	27,697	25,190
Services	11,785	15,599	22,539
Auxiliaries	24,228	14,959	14,878
Total	710,498	716,114	753,699

For each establishment, sales, payroll, number of employees, a 6-digit NAICS code, name and address, and a primary identifier were extracted, and a measure of size (MOS) was computed. The MOS was designed to approximate an establishment's annual total value of shipments for the year 2014 or 2015. One reason we say approximate is because often, we compute the MOS as the sales from the 2012 Economic Census, multiplied by the ratio of the 2014 (or 2015) payroll to the 2012 payroll.

All of the establishments included on the sampling frame had state and county geographic codes. We used these codes to assign each establishment to one of the 132 detailed geographic areas (called CFS Areas) used for sampling and publication. There are three types of CFS Areas:

1. Metropolitan area (MA): The state part of a selected metropolitan statistical area (MSA) or combined statistical area (CSA).
2. The Remainder of State (ROS): The portion of a state containing the counties that are not included in the MA type CFS Areas defined above.
3. Whole state: An entire state where no MA type CFS Areas are defined within the state. In this instance, the ROS is the whole state.

Table 4 in the "Geographic Strata" section shows the counts of these three types of CFS Areas.

Stratification

The sampling frame was primarily stratified by geography and industry, then later substratified by MOS[1] class, with some exceptions for auxiliary establishments and

[1] The MOS of an establishment is an estimate of its annual value of shipments derived from data contained on the Census Bureau's Business Register. It is used to assign each establishment to a size substratum within each primary stratum (which are usually defined by geography and industry).

hazardous materials establishments, as described below. These geography by industry cells form the primary strata for the main part of the sample.

Geographic Strata

Geographic strata were defined by a combination of the 50 states, the District of Columbia, and the CFS Areas selected based on their population and importance as transportation hubs or foreign trade gateways. These CFS Areas were defined using the Office of Management and Budget's 2015 definitions (OMB Bulletin 15-01). All other MAs were collapsed with the nonmetropolitan areas within the state into ROS CFS Area strata. When a MA crossed state boundaries, we considered the size of each state part of the MA when determining whether or not to create geographic strata in each state in which the MA was defined. For example, the Chicago CSA was split into two CFS Areas: the Illinois part and the Indiana part. The Wisconsin part of Chicago was considered too small to be a separate CFS Area and was combined into the Remainder of Wisconsin CFS Area. Table 4 summarizes the number of CFS Areas used for sampling and publication by type.

Table 4.
Summary of 2017 CFS Geographic Stratification

Geographic stratum (CFS Area) type	Number of sampled CFS Areas
Metropolitan area (CSA or MSA) state part	84
Remainder of State (ROS)[1]	35
Whole state (AK, AR, ID, IA, ME, MS, MT, NM, ND, SD, VT, WV, and WY)	13
Total number of CFS Areas	132

[1] Three states do not have a ROS component: DC, NJ, and RI.

See Figure 1 ("Map of 2017 CFS Areas") at the end of the "2017 CFS Methodology" that shows the 84 MA type CFS Areas.

Industry Strata

The industry strata were defined as follows. Within each of the geographic strata, we defined 48 industry groups based on the 2012 NAICS codes:

- Three in mining (4-digit NAICS).
- Twenty-one in manufacturing (3-digit NAICS).
- Eighteen in wholesale (4-digit NAICS).
- Two in retail (NAICS 4541 and 45431).
- One in services (NAICS 5111 and 51223 combined).
- Three in auxiliaries (combinations of NAICS 484, 4931, and 551114).

For auxiliaries that responded to the Advance Survey and were found to be shippers, 132 primary strata were created, one in each CFS Area, combining NAICS 484, 4931, and 551114.[2] For auxiliary establishments that did not respond to the Advance Survey, two separate sets of strata were created because establishments in NAICS 484 and 4931 are much more likely to be shippers than establishments in 551114 and therefore we wanted to sample them at a higher rate than establishments in NAICS 551114. These strata were:

- Up to 132 strata (one per CFS Area) for nonresponding truck transportation establishments and warehousing and storage establishments (NAICS 484 and NAICS 4931).
- Up to 132 strata (one per CFS Area) for nonresponding corporate, subsidiary, and regional managing offices establishments (NAICS 551114).

Hazardous Materials (HAZMAT) Strata

In order to produce good estimates of HAZMAT shipments, we identified and used 21, 6-digit NAICS industries with high amounts of HAZMAT shipments to form primary strata. The 2012 CFS data were used to identify these industries and in general, these industries were chosen because:

- They had a large (weighted) total value or total tonnage of HAZMAT.
- A high percentage of their (unweighted) shipments were HAZMAT.

Fifteen of the 21 HAZMAT NAICS industries were made certainty strata[3] and the remaining 6 industries were made into primary strata defined by state and the 6-digit NAICS code.

[2] The Advance Survey identified these auxiliaries as shippers. However, their NAICS codes give no indication of the types of commodities that they ship so they were sampled together.

[3] Certainty strata are ones where every establishment in the strata on the frame is also included in the sample. In other words, they are selected into the sample with certainty.

Table 5 shows the number and types of primary strata for the main, auxiliary, HAZMAT parts of the sample, plus two special certainty strata. Note that these are the number of strata before they are further stratified by MOS, with the exception of the HAZMAT certainty strata and the two special certainty strata.

Determining the sample sizes, stratifying by MOS size class, and sample selection

The total desired sample size for the first-stage sample was 104,000 establishments (roughly similar to prior surveys) and was fixed due to budget constraints. Therefore, in addition to defining the strata, a sample size was determined for each primary stratum. This was performed as follows:

- A target coefficient of variation (CV) for estimated total MOS was assigned to each primary stratum (geography by industry cell). These target CVs ranged from approximately 0.75 percent to 2.25 percent and, in general, MA type CFS Areas had smaller target CVs than ROS CFS Areas.
- Within each primary stratum, substrata defined by MOS were developed to minimize the sample size needed to achieve the target CV. The establishments in the largest MOS size class were taken with certainty. For the noncertainty substrata, the sample was allocated according to Neyman allocation, since Neyman allocation minimizes the sample size needed to achieve a target CV.
- Once the minimum sample sizes for each primary stratum were determined, they were added together and compared to the desired target sample size of about 104,000. If the total was not close enough to 104,000, we multiplied all of the target CVs by a fixed factor and repeated the process until the total sample size was close to 104,000. In the end, we decided that we were willing to accept a sample size of 103,877 establishments.
- The establishments in the geography by industry by MOS size class substrata were selected by simple random sampling without replacement. The total sample size was 103,877 establishments of which 51,266 were selected with certainty (see Table 6).

Second Stage—Reporting Week Selection

The frame for the second stage of sampling consisted of the 52 weeks in 2017. Each establishment selected into the 2017 CFS sample was systematically assigned to report for four reporting weeks, one in each quarter of the reference year (2017). Each of the 4 weeks was in the same relative position in the quarter. For example, an establishment might have been requested to report data for the 5th, 18th, 31st, and 44th weeks of the reference year. In this instance, each reporting week corresponds to the 5th

Table 5.
2017 CFS Primary Stratification Summary

Sample component		Number of primary strata	Number of sample establishments
Main (NAICS x CFS Area)		5,740	95,147
Auxiliary	Advance Survey responders	132	2,317
	Advance Survey nonresponders (NAICS 484 and 4931)	130	1,268
	Advance Survey nonresponders (NAICS 551114)	132	1,196
HAZMAT	Certainty (15 industries)	15	1,319
	Sampled (6 industries x state)	281	2,116
Special certainty strata	Air or water shipper in prior CFS	1	498
	Establishment specifically identified to be included	1	16

Table 6.
2017 CFS Frame and Sample Summary Statistics

Primary strata type	2017 Frame		2017 Sample			
			Total sample		Certainty component	
	Estabs	Total MOS (million dollars)	Estabs	Total MOS (million dollars)	Estabs	Total MOS (million dollars)
Main	686,269	11,365,387	95,147	8,920,109	44,955	8,354,651
Auxiliary	16,625	1,550,228	4,781	1,503,315	3,141	1,495,515
HAZMAT	7,090	895,154	3,435	871,990	2,656	863,905
Special certainty	514	254,569	514	254,569	514	254,569
Total	710,498	14,065,338	103,877	11,549,983	51,266	10,968,640

week of each quarter. Prior to assignment of weeks to establishments, we sorted the selected sample by primary stratum (geography x industry) and MOS. Each week of the quarter had 7,990 or 7,991 establishments assigned to it.

Third Stage—Shipment Selection

For each of the four reporting weeks in which an establishment was asked to report, the respondent was requested to construct a sampling frame consisting of all shipments made by the establishment in the reporting week. Each respondent was asked to count or estimate the total number of shipments comprising the sampling frame and to record this number on the questionnaire. For each assigned reporting week, if an establishment made more than 40 shipments during that week, we asked the respondent to select a systematic sample of the establishment's shipments and to provide us with information only about the selected shipments. The number of shipments to be selected (and reported) depended on the total number of shipments in the reporting week. Table 7 summarizes the reporting requirements. In general, an establishment with a large number of shipments in a week was required to report more of those shipments. If an establishment made 40 or fewer shipments during that week, we asked the respondent to provide information about all of the establishment's shipments made during that week (i.e., no sampling was required).

Table 7.
CFS Third-Stage Sampling Sample Sizes

Total number of shipments in the reporting week	Respondent action	Minimum number of shipments to be reported	Maximum number of shipments to be reported
1–40	Report every shipment	1	40
41–600	Select (and report) a systematic sample of shipments	21	40
601–3,000		30	60
3,000 or more		50	80

DATA COLLECTION

Each establishment selected into the CFS sample was mailed either a letter or a questionnaire for each of its four assigned reporting weeks, that is, an establishment was required to report once every quarter of 2017. Larger establishments (approximately 70 percent of the sample), determined by MOS, were mailed a letter and were instructed to report electronically through the online instrument. Smaller establishments (approximately 30 percent of the sample) were mailed a questionnaire and could report via paper or electronically. Establishments reporting electronically in one quarter were sent letters instead of questionnaires in subsequent quarters. Approximately 89 percent of the questionnaires were returned using the online instrument and nearly 8 percent were returned on a paper questionnaire. A small number (approximately 3 percent) of responses were collected via other means—mostly spreadsheets through the Secure Messaging Center or by telephone. For a given establishment, the respondent was asked to provide the following information about each of the establishment's reported shipments:

- Shipment ID number.
- Shipment date (month, day).
- Shipment value.
- Shipment weight in pounds.
- Commodity code from Standard Classification of Transported Goods (SCTG) manual.
- Commodity description.
- An indication (Yes or No) of whether the shipment was temperature controlled.
- United Nations or North American (UN/NA) number for a HAZMAT shipment.
- U.S. destination (city, state, ZIP code)—or gateway for an export shipment.
- Domestic modes of transport.
- An indication (Yes or No) of whether the shipment was an export.
- City and country of destination for an export shipment.
- Export mode of transport.

See the 2017 questionnaire and instruction guide at <www.census.gov/programs-surveys/cfs/technical-documentation/questionnaires.html>.

By CFS definition, a shipment is a single movement of goods, commodities, or products from an establishment to a single customer or to another establishment owned or operated by the same company as the originating establishment (e.g., a warehouse, distribution center, or retail or wholesale outlet). Full or partial truckloads were counted as a single shipment only if all commodities on the truck were destined for the same location. For multiple deliveries on a route, the goods delivered at each stop were counted as one shipment. Interoffice memos, payroll checks, or business correspondence were not included in the CFS. Likewise, the CFS does not include shipments of refuse, scrap paper, waste, or recyclable materials unless the establishment was in the business of selling or providing these materials.

Table 8.
SCTG Code Changes

SCTG		Description
2012	2017	
07-R	07	Prior to 2012 CFS, Fats and oils were all classified under commodity code 07. For CFS 2012 CFS, oils and fats treated for use as biodiesel moved to commodity code 18 under Fuel Oils.
074-R	074	Prior to the 2012 CFS, fats and oils intended for use as biodiesel were not specifically identified, but were included in commodity code 074. In the 2012 CFS, fats and oils intended for use as biodiesel were specified and classified in under commodity code 182 (biodiesel and blends of biodiesel).
0743-R	0743	Prior to the 2012 CFS, fats and oils intended for use as biodiesel were not specifically identified, but were included in commodity code 0743. In the 2012 CFS, fats and oils treated for use as biodiesel were specified and classified under commodity code 182.
08-R	08	Prior to the 2012 CFS, alcohols intended for use as fuel were not specifically identified, and were included under SCTG 08. In the 2012 CFS, ethanol for fuel moved to SCTG 17. Additionally, beverages and denatured alcohol were more clearly identified.
083-R	083	Prior to the 2012 CFS, denatured alcohol of more than 80 percent alcohol by volume was included in commodity code 083. In the 2012 CFS, denatured alcohol of more than 80 percent by volume was moved to commodity code 084, and ethanol for use as biofuel was moved to commodity codes 175 and 176.
0831-R	0831	Prior to the 2012 CFS, both Denatured ethyl alcohol, and undenatured ethyl alcohol of more than 80 percent alcohol by volume were included in commodity code 0831. In the 2012 CFS, denatured alcohol of more than 80 percent by volume was moved to commodity code 0841, and ethanol for use as biofuel was specified and moved to commodity codes 175 and 176.
17-R	17	Prior to 2012 CFS, Denatured ethyl alcohol, and undenatured ethyl alcohol were all classified under SCTG 08. For CFS 2012 CFS, ethanol that is used for fuel was identified and removed from SCTG 08 to SCTG 17 under fuel alcohols. Also, kerosene, which prior to 2012 CFS, was included in commodity code 19, was moved under commodity code 17.
171-R	171	Prior to the 2012 CFS, commodity code 171 only included gasoline, and blend of gasoline and ethanol were not identified. In the 2012 CFS, commodity code 171 includes gasoline, and mixtures of up to 10 percent ethanol and gasoline.
172-R	172	Prior to the 2012 CFS, kerosene was included in commodity code 192, and type A jet fuel was classified under commodity code 172. In the 2012 CFS, all kerosene are classified under commodity code 172.
1720-R	1720	Prior to the 2012 CFS, kerosene was included in commodity code 192, and type A jet fuel was classified under commodity code 1720. In the 2012 CFS, all kerosene is classified under commodity code 1720.
18-R	18	Prior to the 2012 CFS, fats and oils intended for use as fuel were not identified as such, and were included in commodity code 07. In the 2012 CFS, such fats and oils were identified as biodiesel and were moved under commodity code 18.

For a shipment that included more than one commodity, the respondent was instructed to report the commodity that made up the greatest percentage of the shipment's weight.

Commodity Coding Changes for 2017

There were no changes or additions to the definitions of commodities for 2017. However the "-R" suffixes attached to SCTGs that were redefined in 2012 have been dropped (see Table 8).

EDITS

The reported data are run through a series of establishment and shipment level edits that look for inconsistences among the data items. During the review of these edit failures, individual analysts may change specific shipment level or establishment level data items. Other edit failures may be corrected in subsequent imputation processes. In addition, the mileage calculation process may change respondent reported modes of transportation.

IMPUTATION

Imputation of Shipment Value or Weight

If the ratio of a shipment's value-to-weight is unacceptable (falls outside of a commodity-specific range), or if one of these values is missing, then one of the unacceptable (or missing) values is replaced by a predicted value obtained from a donor imputation model. Such a shipment is considered a "recipient" if its commodity code is valid and one of the two data items (either shipment value or shipment weight) is reported, greater than zero, and the shipment is otherwise useable. The recipient's data item is imputed as follows:

First, a donor shipment for a given recipient with the same 5-digit SCTG is selected at random from a pool of potential donor shipments (those with valid SCTGs and with reported or edited shipment value and weight). The donor pool levels are summarized below in order of preference (the lowest numbered donor pool containing a matching shipment is used) along with the number of shipments that had value or weight imputed at that level (see Table 9).

Table 9.
Shipment Value and Weight Imputation

Level	Imputation cell variables (donor pool)	Number of shipments imputed at that level	
		Values	Weights
1	Same SCTG, establishment, and detailed shipment size class	108,343	70,014
2	Same SCTG, company, and detailed shipment size class	17,323	45,495
3	Same SCTG, origin state and CFS Area, and detailed shipment size class	24,110	105,055
4	Same SCTG, establishment, and broad shipment size class	597	456
5	Same SCTG, company, and broad shipment size class	63	1,388
6	Same SCTG, origin state and CFS Area, and broad shipment size class	870	2,661
7	Same SCTG and establishment (no restriction on shipment size)	365	389
8	Same SCTG and company (no restriction on shipment size)	170	1,569
9	Same SCTG and origin state and CFS Area (no restriction on shipment size)	1,183	3,443
10	Same SCTG (Median value-to-weight ratio of the SCTG was used)	1,812	3,999
Total number of imputed shipment values and weights		154,836	234,469
As a percentage of total shipments with value and weight (percent)		2.42	3.66

Note: Due to other missing data items, some of these shipments may not have been used in the final tabulations.

Then, the donor's value and weight data are used to calculate a ratio, which is applied to the recipient's reported item, to impute the item that is missing or that failed the edit. If a donor could not be found in one of the nine donor pools then the recipient's item is imputed using the median value-to-weight ratio computed using all shipments in the same SCTG as that of the recipient (level 10 in Table 9). As shown in Table 9, approximately 390,000 shipments had either their value or weight imputed.

Destination ZIP Code Correction and Imputation

A shipment's origin and destination ZIP codes are the primary inputs to determining the shipment's distance traveled (see the "Mileage Calculation" section). For some reported shipments, the destination ZIP code was missing or was not a valid ZIP code for the reported destination city. In the case of invalid ZIP codes, if the invalid ZIP code could be converted to a valid ZIP code for the destination city by: changing a single digit (other than the first one) or transposing two digits, then the ZIP code was changed to a valid one for the reported destination city. Approximately 72,700 destination ZIP codes were corrected in this process. In addition, misspellings (SAINT LOIUS) and abbreviations (ST LOUIS) of destination city names were corrected and standardized (SAINT LOUIS) and some states codes corrected (respondent reported AL instead of AK for Alaska, for example).[4] Table 10 summarizes the corrections made.

For shipments with a valid destination city and state but missing a destination ZIP code, a ZIP code was imputed using a two stage hot-deck process. A shipment was considered a "recipient" if its destination city and state

[4] The shipment destination city name and state are not directly used in the calculation of mileage.

Table 10.
Destination City, State, and ZIP Code Corrections

Corrections made to destination geography	Number of shipments corrected
City name	298,969
State	16,747
City name and state	1,490
ZIP code	69,620
ZIP code and city name	2,149
ZIP code and state	810
ZIP code, city, and state	123
Total number of corrections	389,908
Of which: ZIP code corrections (last 4 rows)	72,702
As a percentage of total shipments with destination ZIP codes (percent)	1.17

Note: Due to other missing data items, some of these shipments may not have been used in the final tabulations.

were valid but its destination ZIP code was missing. The recipient's missing ZIP code was imputed as follows:

- In the first stage, the donor pool for each recipient consisted of all complete shipments with the same destination city and state as the recipient and also from the same establishment as the recipient. If this donor pool was not empty then one of the shipments in this donor pool was randomly selected and the destination ZIP code of this selected donor was assigned to the recipient.
- If in the first stage the donor pool was empty (there was no matching shipment from the same establishment), then the donor pool was enlarged to include all complete shipments with the same destination city and state as the recipient, regardless of source. Then one of the shipments in this larger donor pool was randomly selected and the destination ZIP code of the selected donor assigned to the recipient.

Approximately 27,400 missing shipment destination ZIP codes were imputed in this process as shown in Table 11.

Table 11.
Destination ZIP Code Imputation

Level	Imputation cell variables (donor pool)	Number of ZIP codes imputed
1	Same establishment, destination city, and destination state	10,980
2	Same destination city and state	16,419
Total number of imputed ZIP codes		27,399
As a percentage of all shipments with destination ZIP codes (percent)		0.44

Note: Due to other missing data items, some of these shipments may not have been used in the final tabulations.

For some shipments, the respondent provided a post office box (P.O. Box) ZIP code as the destination ZIP code. A P.O. Box destination ZIP code would only be deemed as valid if the shipment was a parcel shipment and had a reported shipment weight less than 70 lbs. If both requirements were not met, it was determined that the P.O. Box destination ZIP code was not sufficient and would need to be replaced with a non-P.O. Box destination ZIP code. A hot-deck process was used to replace these P.O. Box ZIP codes with a standard ZIP code in a process similar to the destination ZIP code imputation described above. Approximately 73,500 shipments had their reported P.O. Box ZIP code replaced with a standard ZIP code as summarized in Table 12. Additionally, for the rare cases where a P.O. Box ZIP code was reported as the shipment origin ZIP code, all such cases were replaced with a non-P.O. Box origin ZIP code by CFS analysts who resolved the issue directly with respondents. See Table 12.

Table 12.
Destination P.O. Box ZIP Code Imputation

Level	Imputation cell variables (donor pool)	Number of ZIP codes imputed
1	Same establishment, destination city, and destination state	37,782
2	Same destination city and state	35,673
Total number of imputed ZIP codes		73,455
As a percentage of all shipments with destination ZIP codes (percent)		1.18

Note: Due to other missing data items, some of these shipments may not have been used in the final tabulations.

Commodity Code (SCTG) Imputation

For 2017, commodity (SCTG) codes were imputed in three phases.

1. A machine learning process was used to code some shipments where the respondent provided a description of the product but not an SCTG code. In particular, we developed a model using the 6.2 million records that respondents coded themselves. This model outputs the highest-likelihood SCTG code using two input variables: the NAICS code of the establishment from which the shipment record came and the description (as a "bag-of-words") from each record. Using the model's reported prediction probability as a guide, we took a sample of 750 records that did not have an SCTG code, and had expert analysts validate the model's predictions on these records. When the model reported probability of 40 percent or higher, we validated that the model was classifying records with 80 percent accuracy. Below 40 percent, validated accuracy dropped precipitously, and thus we chose 40 percent as a model probability threshold. From this validation exercise, we were able to assign an SCTG code to approximately 106,000 shipments (1.65 percent of all shipments with SCTGs) with a high degree of confidence using the model's output.
2. In some instances it was not possible to determine a 5-digit SCTG with the required confidence in the machine learning process described above. In particular this was because, as described above, the model did not predict a 5-digit SCTG code with probability greater than 40 percent. However it was possible to assign a 2-digit code with confidence. For these 14,000 shipments, the CFS used a hot-deck method to assign full 5-digit SCTGs from donors with the same 2-digit SCTG. Table 13 shows the five levels of the imputation cells and the number of recipients for whom an SCTG donor was found at each level. The recipients were split into two groups: those with a UN/NA HAZMAT code and those without. If a donor

was not found at the first level then the donor pool was enlarged to include more—but slightly less similar—donors. The shipment value-to-weight ratio was used to identify the nearest neighbor donor. If the value-to-weight ratio could not be computed (because either value or weight was missing) then the donor was chosen randomly from donors within the imputation cell. This process of enlarging the donor pool continued until a donor was found for each recipient. In some cases, the recipient's UN/NA code and temperature control code were also replaced with the donor's to ensure that the SCTG, UN/NA code, and temperature control code assigned to the recipient were all consistent.

Table 13.
SCTG Imputation: Phase 2

A. Shipments With a UN/NA Code

Level	Imputation cell variables (donor pool)	Number of shipments imputed at that level
1	Same company, UN/NA code, and SCTG2	209
2	Same UN/NA code and SCTG2	149
3	Same company and SCTG2	28
4	Same NAICS and SCTG2	53
5	Same SCTG2	0
Subtotal		439

B. Shipments Without a UN/NA Code

Level	Imputation cell variables (donor pool)	Number of shipments imputed at that level
1	Same establishment and SCTG2	8,605
2	Same company and SCTG2	1,168
3	Same NAICS, state, and SCTG2	3,327
4	Same NAICS and SCTG2	635
5	Same SCTG2	9
Subtotal		13,744
Grand total		14,183
As a percentage of all shipments with SCTGs (percent)		0.22

Note: Due to other missing data items, some of these shipments may not have been used in the final tabulations.

3. For the 30,000 shipments still missing an SCTG (largely because the respondent did not provide a shipment description) an SCTG was imputed using a process similar to that above except that a 2-digit SCTG (SCTG2) was not available. Table 14 summarizes the results of this imputation process.

Table 14.
SCTG Imputation: Phase 3

A. Shipments With a UN/NA Code

Level	Imputation cell variables (donor pool)	Number of shipments imputed at that level
1	Same company and UN/NA code	623
2	Same UN/NA code	771
3	Same company	50
4	Same NAICS and state	1
5	Same NAICS	0
Subtotal		1,445

B. Shipments Without a UN/NA Code

Level	Imputation cell variables (donor pool)	Number of shipments imputed at that level
1	Same establishment	21,203
2	Same company and NAICS	962
3	Same company	153
4	Same NAICS and state	5,822
5	Same NAICS	280
Subtotal		28,420
Grand total		29,865
As a percentage of all shipments with SCTGs (percent)		0.46

Note: Due to other missing data items, some of these shipments may not have been used in the final tabulations.

HAZMAT Code (UN/NA) Imputation

Shipments with certain SCTG codes are HAZMAT and the respondent should have also reported a UN/NA HAZMAT code. For the 19,000 shipments where no UN/NA code was reported (but should have been), a hot-deck imputation method (similar to that used for SCTG imputation) was used to assign a UN/NA code from a similar donor. Table 15 summarizes the results of that imputation process.

Temperature Control Code Correction and Imputation

The temperature control code (Yes or No) is an indication of whether or not the shipment required a temperature controlled environment while being shipped. Missing or invalid temperature control code responses were corrected or imputed in two operations. Table 16 shows the number of shipments corrected (Yes changed to No, or vice versa) or imputed when missing. These shipments were imputed or corrected in accordance with temperature control standards for each commodity.

Table 15.
UN/NA Imputation

Level	Imputation cell variables (donor pool)	Number of shipments imputed at that level
1	Same establishment and SCTG	3,695
2	Same company and SCTG	7,380
3	Same NAICS, state, and SCTG	5,265
4	Same NAICS and SCTG	1,967
5	Same NAICS4 and SCTG	536
6	Same SCTG	216
Total		19,059
As a percentage of all shipments with UN/NA codes (percent)		4.23

Note: Due to other missing data items, some of these shipments may not have been used in the final tabulations. NAICS is the full 6-digit code, NAICS4 is the 3- or 4-digit NAICS used for sampling and publication.

Table 16.
Temperature Control Code Correction and Imputation

Process	Number of shipments affected
Temperature control code corrections	80,087
Temperature control code imputations	27,518
Total	107,605
As a percentage of all shipments with a temperature control code (percent)	1.67

Note: Due to other missing data items, some of these shipments may not have been used in the final tabulations.

MILEAGE CALCULATION

The CFS does not ask respondents to report the distance traveled for each shipment. However, origin and destination ZIP codes, transportation modes, commodity, and foreign country (if applicable) are required from respondents. Using these variables, a mileage estimate can be generated. To calculate mileage for shipments collected during the 2017 CFS, a mileage routing tool was developed by BTS. This tool, referred to as GeoMiler, uses current ArcGIS technology along with the latest transportation networks and routing algorithms to form likely routes for each shipment collected in the survey.

Highway

The commercial truck routing software, PC Miler, was used as the highway network for GeoMiler. PC Miler specializes in freight-focused routing as it is widely used as a navigational tool in the commercial trucking industry. Routes were generated based on the practical route setting which considers numerous variables (distance, road classification and quality, truck-restricted roads, tolls, etc.) during the route selection process. Mileage for company-owned truck, for-hire truck, and parcel (ground only) shipments are calculated over the highway network.

Rail

The latest Federal Railroad Administration (FRA) rail network was used for rail shipments collected in the 2017 CFS. The network contains all Class 1 and shortline railroads. The rail stations included in the GeoMiler rail network were obtained from RAILINC. The rail routes generated by GeoMiler were largely determined by stations chosen based on observed data from the Surface Transportation Board's Waybill Sample data.

Using the rail station within the origin ZIP code or destination ZIP code was the general preference, but if those facilities did not support the commodity being shipped, the program would search for the most likely facility based on distance and volume. If the selected facility fell outside of the origin or destination ZIP code, truck drayage was added to the shipment. If the shipment weight was too great or the truck drayage component too great in distance, GeoMiler would flag the shipment for manual correction by an analyst.

A set of Class 1 railroad transfer points (interlining) were identified from the Waybill. If the selected origin and destination stations were owned by separate Class 1 owners, then a transfer was deemed necessary. Under such a scenario, GeoMiler would select the most likely transfer point based on the order of the modeled carrying companies (e.g. Norfolk Southern to Union Pacific), transfer point volume, and overall distance.

Water

The latest United States Army Corps of Engineers (USACE) waterway network was used for water shipments collected in the 2017 CFS. The network links are classified by shallow draft, deep draft, and Great Lakes. The ports and docks included in the network also come from the USACE. The water terminals used by GeoMiler were largely based on observed data from the USACE Commodity Detail Dock-to-Dock Movement dataset. The CFS publishes water estimates by water pathway classifications, which includes inland water (usually shallow draft vessels such as barges), deep sea (usually deep draft vessels or oceangoing barges), and the Great Lakes. Shipments that transferred between different types of water links are classified under multiple waterways.

Using a dock within the origin ZIP code or destination ZIP code was GeoMiler's preference, but if those facilities did not support the commodity being shipped, the program would search for the most likely facility based on distance and volume. If the selected facility fell outside of the origin or destination ZIP code, truck drayage was added to the shipment. If the shipment weight was too great or the truck drayage component too great in distance, GeoMiler would flag the shipment for manual correction by an analyst.

Air

The air network was built by BTS personnel using BTS' Office of Airline (OAI) T-100 Segment data. The air network consists of air routes that have regular air freight service in all states except Alaska where a major consideration is the ability to access all potential points. This includes the networks of the largest parcel carriers, as well as a consolidated network that primarily covers freight activity on passenger airlines. The air routes generated by GeoMiler were based on an algorithm that factored in distance and air route volume, while generally preventing shipments from being transferred among air carriers. More information about changes to air mileage calculation can be found in the "Methodological Changes to Mileage Calculation for the 2017 CFS" section.

Pipeline

For pipeline shipments, ton-miles and average miles per shipment are not shown in the data files. 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 value and tons per shipment. For security purposes, there is no pipeline network available in the public domain with which to route petroleum-based products. Hence, any modal distance, either single or multi, involving pipeline was considered as solely pipeline mileage from origin ZIP code to destination ZIP code and calculated to equal the Great Circle Distance (GCD). GCD is defined as the shortest distance between two points on the earth's surface, taking into account the earth's curvature.

Multimodal Shipments

For multi-mode shipments (i.e., shipments involving more than one mode, such as truck and rail shipments, and more than one transportation network) the transfer between modes occurred at select facilities known to support such transfers. As with single-mode shipments, business rules were established to pick the most likely transfer point based on commodity, volume, and distance.

Exports

For shipments to Canada and Mexico, the mileage was calculated between the origin ZIP code and the border crossing point. For shipments to other foreign locations, the mileage was calculated between the origin ZIP code and the U.S. territorial border (this extends 12 nautical miles beyond the coastline). Mileage outside of U.S. territory was not counted. In both cases, a Port of Exit (POE), either seaport, airport, or border crossing point, was found based on an established order of processes.

GeoMiler first checked for respondent-provided data in the POE field of the questionnaire. If found to be valid, GeoMiler would route to the provided POE. If the POE field contained invalid data or was void of information, the next step was to consider the proximity between the provided shipping address and the nearest POE. If an establishment was located within a short distance of export facilities, then it was assumed that the shipment would exit from there, and GeoMiler would use that nearby POE.

If the first two options failed, provided POE information was missing or invalid, GeoMiler would then select a likely POE based on the characteristics of the shipment record. Using the foreign destination information, origin state, mode of transportation, and commodity information from the shipment record, GeoMiler would select a likely POE that was based on patterns observed in Census Bureau Foreign Trade export data. For exports to Canada and Mexico, further consideration was given to destination locations within those countries.

For additional information about exports, see the "Methodological Changes to Mileage Calculation for the 2017 CFS" section.

ZIP Codes

The source of ZIP codes in GeoMiler is PC Miler. For domestic shipments, the mileage is calculated between the origin ZIP code point and the destination ZIP code point. For export shipments, the mileage is calculated between the origin ZIP code point and the POE/U.S. territorial border. The ZIP code point is a latitude/longitude coordinate determined by the location of commercial activity within the ZIP code rather than the geographic center of the ZIP code. See more about ZIP code point placement in the "Methodological Changes to Mileage Calculation for the 2017 CFS" section.

For intra-ZIP code shipments, shipments with the origin and destination in the same ZIP code, the square root of the total ZIP code area in square miles was used as an estimate for the distance shipped.

METHODOLOGICAL CHANGES TO MILEAGE CALCULATION FOR THE 2017 CFS

BTS continues to seek improvements to the quality of the information produced from its flagship survey for data collection, the CFS. A critical measurement calculated from CFS data is the mileage traveled by each shipment. This measurement is used to calculate the ton-miles, a statistic unique to this survey. With a valid origin and destination ZIP code, and valid commodity, GeoMiler will calculate the distance traveled (in miles) by mode for each shipment reported in the CFS.

The following types of methodological changes to mileage processing were incorporated in 2017:

Use of Commodity for Rail Station and Dock Selection

In 2012, the nearest rail station or dock was selected regardless of the commodity and volume of the facility. For 2017, observed rail and water shipment data were used to form the routing. The observed inbound and outbound commodities for each station and dock were built into the rail network and waterway network, respectively. The rail station and dock selection were based on the directional commodity information along with volume and distance from the origin and destination ZIP codes.

Using the rail station or dock within the origin ZIP code or destination ZIP code was GeoMiler's preference, but if those facilities did not support the commodity being shipped, the program would search for the most likely facility based on the requirements stated above. If the selected facility fell outside of the origin or destination ZIP code, truck drayage was added to the shipment. If the shipment weight was too great or the truck drayage component too great in distance, GeoMiler would flag the shipment for manual correction by an analyst.

Shipments that included a truck drayage component are classified as "truck and rail" and "truck and water" in the CFS estimates.

Use of Designated Transfer Points

Rail

In 2012, transfers were allowed to occur at any railroad junction, regardless of station owner and trackage rights. The 2017 methodology for determining rail routes is described in the "Mileage Calculation" section under "Rail."

Water

For 2017, based on observed water shipment data, a set of shallow draft-deep draft transfer points were identified and used by GeoMiler when necessary. The accessibility of the water network at the origin and destination docks, as well as the shipment weight, were determining factors in deciding if a transfer between vessels was likely. Such shipments are classified as "multiple waterway" shipments in the CFS estimates.

In 2012, the classification of a shipment as a "multiple waterway" shipment was based on a switch in water modes (i.e., inland water to deep sea) and was solely based on the classification of the USACE waterway network links. The origin and destination, and shipment weight, were not taken into account. In 2017, to provide a more accurate picture of shipping patterns, we placed greater importance on the geography (origin and destination) and shipment weight versus the classification of the links embedded in the waterway network.

Air Routing

In 2012, the impedances for the air network were determined by airport volumes and distances. For 2017, the impedances are based on airport-to-airport link volumes, with the largest freight carriers having their own isolated subnetworks. In 2017, if the respondent indicated a shipment mode of "parcel air," the shipment was kept on the same parcel air network from origin to destination. In 2012, air shipments would be susceptible to transfers among numerous air carriers between origin and destination. Furthermore, the greater the incompleteness of the system in 2012, the greater the likelihood of needing to manually process these shipments. The subnetwork chosen was based on an impedance formula that evaluated air carrier volume and airport distance from the origin and destination ZIP codes. If the respondent indicated air, all four subnetworks were considered.

There was also an expansion of air network coverage. In 2012, there were 137 non-Alaska airports, and the air network in the 2017 CFS contains 247 non-Alaska airports.

Exports

In 2017, (as described in the "Mileage Calculation" section under "Exports") the process for selecting the best routing for export shipments was:

- GeoMiler would first check for respondent-provided data in the POE field of the questionnaire.
- If the POE field contained invalid or no information, the next step was to consider the proximity between the provided shipping address and the nearest POE.
- If the first two options failed GeoMiler would then select a likely POE based on the characteristics of the shipment record.

The 2012 version of GeoMiler did not consider respondent-provided POE information, nor proximity to a POE. Rather, the program imputed a POE for all export shipments. Additionally, the list of available exit points was expanded from 2012 based on the observed export data. This

change, along with an established order of processes to determine the best gateway for export shipments should result in observations that are closer to other observed datasets.

Additionally for 2017, to establish consistency with mileage calculation for air exports, water mileage between the POE seaport and the U.S. territorial border was calculated and contributed to total mileage for the shipment. Previously in 2012, this water mileage was not counted. Only air mileage between the POE airport and the U.S. territorial border was counted before. Because of this, total deep sea mileage is likely to increase while average miles per shipment is likely to decrease. The majority of POE seaports are located along the coast and are within a short distance of the U.S. territorial border, leading to an increase in low mileage deep sea shipments.

ZIP Codes

All GeoMiler routings are point-to-point routings and are calculated from a point in the originating establishment's ZIP code to a point in the destination ZIP code. For 2017, the location of the ZIP code points were determined by the commercial activity of the ZIP code; tending to be located closer to the more populous areas within the ZIP code. In 2012, ZIP code points were located on the geographic centroid of the ZIP code. Commercial activity and population were not considered.

For ZIP codes smaller in size, this change is minimal. But for ZIP codes larger in size, the distance between a commercial activity weighted point and the geographic centroid can be substantial.

ESTIMATION

Estimated totals (e.g., value of shipments, tons, ton-miles) are produced as the sum of weighted shipment data (reported or imputed). Percent change and percent of total estimates are derived using the appropriate estimated totals. Estimates of average miles per shipment are computed by dividing an estimate of the total miles traveled by the estimated number of shipments.

Each shipment has associated with it a single tabulation weight, which was used in computing all estimates to which the shipment contributes. The tabulation weight is a product of seven different component weights. A description of each component weight follows.

CFS respondents provided data for a sample of shipments made by their respective establishments in the survey year. For each establishment, we produced an estimate of that establishment's total value of shipments for the entire survey year. To do this, we used four different weights: the shipment weight, the shipment nonresponse weight, the quarter weight, and the quarter nonresponse weight. Three additional weights are then applied to produce estimates representative of the entire universe. These are the establishment-level adjustment weight, the establishment (or first-stage sample) weight, and the nonresponse post-stratification adjustment weight.

The shipment weight was defined as the ratio of the total number of shipments (as reported by the respondent) made by an establishment in a reporting week to the number of sampled shipments the respondent reported on the questionnaire for the same week. This weight uses data from the sampled shipments to represent all the establishment's shipments made in the reporting week. However, a respondent may have failed to provide sufficient information about a particular sampled shipment. For example, a respondent may not have been able to provide value, weight, commodity, or a destination for one of the sampled shipments. If this data item could not be imputed or otherwise obtained, then this shipment did not contribute to tabulations and was deemed unusable. To account for these unusable shipments, we applied the shipment nonresponse weight. 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 quarter weight inflates an establishment's estimate for a particular reporting week to an estimate for the corresponding quarter. The quarter weight is equal to 13. For each establishment, the quarterly estimates were added to produce an estimate of the establishment's value of shipments for the entire survey year. Whenever an establishment did not provide the Census Bureau with a response for each of its four reporting weeks, we computed 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 (usually four) to the total number of quarters (reporting weeks) for which we received usable shipment data from the establishment.

Using these four component weights and the reported (or imputed) shipment values, we computed an estimate of each establishment's value of shipments for the entire survey year. We then multiplied this estimate by a factor that adjusts this estimated value to the measure of the establishment's value of shipments or receipts used for sample stratification purposes. This weight, the establishment-level adjustment weight, attempts to correct for any sampling errors caused by the selection of specific reporting weeks or that occur during the sampling of shipments by the respondent.

The adjusted value of shipments estimate for an establishment was then weighted by the establishment's weight.

This weight is equal to the reciprocal of the establishment's probability of being selected into the first-stage sample (see the "Sample Design" section).

A final adjustment, for most industries, the nonresponse post-stratification adjustment weight, corrects for nonresponse and coverage changes since sample selection by adjusting the weighted shipment value (computed using all prior weighting factors) to the tabulated revenue data from the 2017 Economic Census as of May 30, 2020. This adjustment accounts for:

- Establishments that did not respond to the survey or from which we did not receive any usable shipment data.
- Changes in the universe of establishments between the times the first-stage sampling frame was constructed (2016) and the year in which the data were collected (2017).

For the final 2017 CFS estimates, the nonresponse post-stratification cells were defined by industry, typically the 3-digit NAICS codes (for Manufacturing) or 4-digit NAICS codes (all other industries) used for sampling, and state. There were 2,296 nonresponse post-stratification cells.

For auxiliary and publishing establishments, the adjustment was performed using the MOS from the initial sampling frame rather than Economic Census data. Receipts for auxiliary establishments are not collected in the Economic Census, because auxiliaries serve only their own companies. For publishing establishments, the receipts in the Economic Census may include revenue from activities that do not involve the shipment of a commodity.

An exception to the above description of the weighting procedure is made for what we call "certainty shipments." These are shipments about which we have learned the number of times they are made in the year. For these shipments, we let the shipment weight equal the number of times they are made in the year. We let the shipment nonresponse weight, the quarter weight, and the quarter nonresponse weight equal one. And the remaining weights are computed as described above.

For NAICS 4247, the Census revenue used for this adjustment was reduced by the portion of that revenue that was derived from the sale of crude oil[5] as crude oil shipments are out of scope to the CFS.

In rare instances, where a very large shipment required several years to construct and was delivered in 2017 (such as large ocean vessels), the Census revenue amount was changed to more accurately reflect the value of shipments rather than the accounting revenue that happened to be recognized by the establishment in 2017.

RELIABILITY OF THE ESTIMATES

The estimates presented by the 2017 CFS may differ from the actual, unknown population values. The difference between the estimate and the population value is known as the total error of the estimate. When describing the accuracy of survey results, it is convenient to discuss total error as the sum of sampling error and nonsampling error. Sampling error is the average difference between the estimate and the result that would be obtained from a complete enumeration of the sampling frame conducted under the same survey conditions. Nonsampling error encompasses all other factors that contribute to the total error of a sample survey estimate.

The sampling error of the estimates in this publication can be estimated from the selected sample because the sample was selected using probability sampling. Common measures related to sampling error are the sampling variance, the standard error, and the coefficient of variation (CV). The sampling variance is the squared difference, averaged over all possible samples of the same size and design, between the estimator and its average value. The standard error is the square root of the sampling variance. The CV expresses the standard error as a percentage of the estimate to which it refers. For percentage estimates, such as percentage change or percentage of a total, the standard error of the estimate is provided.

Nonsampling error encompasses all factors other than sampling error that contribute to the total error associated with an estimate. This error may also be present in censuses and other nonsurvey programs. Nonsampling error arises from many sources: inability to obtain information on all units in the sample; response errors; differences in the interpretation of the questions; mismatches between sampling units and reporting units, between the requested data and data available or accessible in respondents' records, or between reference periods (calendar vs fiscal year, for example); mistakes in coding or keying the data obtained; and other errors of collection, response, coverage, and processing.

Although no direct measurement of nonsampling error was obtained, in conducting the CFS, precautionary steps were taken in all phases of the collection, processing, and tabulation of the data in an effort to minimize its influence. Precise estimation of the magnitude of nonsampling errors would require special experiments or access to independent data and, consequently, the magnitudes are often unavailable. Data users should be aware that the published estimates may be affected by unmeasured nonsampling error.

[5] Based on NAPCS code 4003325000.

Suppressed Estimates

Estimates that had high CVs (greater than 50 percent), or for which the CV could not be computed were suppressed. Some of these suppressed estimates can be derived directly from the CFS tables by subtracting published estimates from their respective totals. However, the suppressed estimates obtained by such subtraction would be subject to poor response, high sampling variability, or other factors that may make them potentially misleading. Estimates derived in this manner should not be attributed to the Census Bureau. The CFS does not suppress estimates for disclosure avoidance because we use a noise infusion method for disclosure avoidance. See the section, "Disclosure Avoidance."

Individuals who use estimates in these tables to create new estimates should cite the Census Bureau as the source of the original estimates.

More detailed descriptions of sampling and nonsampling errors for the 2017 CFS are provided in the following sections.

SAMPLING ERROR

These estimates are based on a sample of shipments reported for a sample of weeks from a sample of establishments. Therefore these estimates are unlikely to exactly agree with results that would be obtained from a complete enumeration of all shipments made in 2017 from all establishments included on the sampling frame. 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.

The particular sample of shipments obtained by the CFS in 2017 is one of a large number of samples of the same size that could have been obtained using the same design. If all possible samples had been surveyed under the same conditions, an estimate of a population parameter of interest could have been obtained from each sample. These samples give rise to a distribution of estimates for the population parameter. A statistical measure of the variability among these estimates is the standard error, which can be estimated from any one sample. The standard error is defined as the square root of the variance. The coefficient of variation (or relative standard error) of an estimator is the standard error of the estimator divided by the estimator itself. For the CFS, the coefficient of variation also incorporates the effect of the noise infusion disclosure avoidance method (see the "Disclosure Avoidance" section).

Note that measures of sampling variability, such as the standard error and coefficient of variation, are estimated from the sample and are also subject to sampling variability and, technically, we should refer to the estimated standard error or the estimated coefficient of variation of an estimator. However, for the sake of brevity, we have omitted this detail. It is important to note that the standard error only measures sampling variability. It does not measure systematic biases of the sample. The Census Bureau recommends that individuals using estimates contained in this report incorporate this information into their analyses, as sampling error could affect the conclusions drawn from these estimates.

An estimate from a particular sample and the standard error associated with the estimate can be used to construct a confidence interval. A confidence interval is a range about a given estimator that has a specified probability of containing the result of a complete enumeration of the sampling frame conducted under the same survey conditions. Associated with each interval is a percentage of confidence, which is interpreted as follows. If, for each possible sample, an estimate of a population parameter and its approximate standard error were obtained, then:

1. For approximately 90 percent of the possible samples, the interval from 1.833 standard errors below to 1.833 standard errors above the estimate would include the result as obtained from a complete enumeration of the sampling frame conducted under the same survey conditions.

2. For approximately 95 percent of the possible samples, the interval from 2.262 standard errors below to 2.262 standard errors above the estimate would include the result as obtained from a complete enumeration of the sampling frame conducted under the same survey conditions. The 1.833 and 2.262 values, used to compute the 90 percent and 95 percent confidence intervals, are taken from the t-distribution with nine degrees of freedom (one less than the number of random groups used to produce the CV estimates). The t-distribution takes into account the uncertainty in the estimation of the CVs (which the CFS computes using the random group method with ten random groups).

To illustrate the computation of a confidence interval for an estimate of total value of shipments, assume that an estimate of total value is $10,750 million and the coefficient of variation for this estimate is 1.8 percent, or 0.018. First obtain the standard error of the estimate by multiplying the value of shipment's estimate by its coefficient

of variation. For this example, multiply $10,750 million by 0.018. This yields a standard error of $193.5 million. The upper and lower bounds of the 90 percent confidence interval are computed as $10,750 million plus or minus 1.833 times $193.5 million or $354.7 million. Consequently, the 90 percent confidence interval is $10,395 million to $11,105 million. If corresponding confidence intervals were constructed for all possible samples of the same size and design, approximately 9 out of 10 (90 percent) of these intervals would contain the result obtained from a complete enumeration.

For estimates that were computed from relatively few shipments, the variance estimate may have been computed from fewer than ten random groups. In this case, the given method of confidence interval construction will produce a confidence interval that will be too narrow for these estimates.

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 sources such as:

- Specification.
- Coverage.
- Measurement.
- Nonresponse.
- Processing.

Although no direct measurement of the potential biases due to 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 their influence. The Census Bureau recommends that individuals using estimates in this report consider these possible sources of error when conducting their analyses, as nonsampling error could affect the conclusions drawn from these estimates.

Some possible sources of bias that are attributed to respondent-conducted sampling include:

- Constructing an incomplete frame of shipments from which to sample.
- Ordering the shipment sampling frame by selected shipment characteristics.
- Selecting shipment records by a method other than the one specified in the questionnaire's instructions.

Nonresponse

A potential source of bias in the estimates is nonresponse. Nonresponse is the inability to obtain all the intended measurements or responses from all units in the sample. Three levels of nonresponse can occur in the CFS:

- Shipment.
- Quarter (reporting week).
- Establishment.

Item nonresponse occurs either when a particular shipment data item is unanswered or the response to the question fails computer or analyst edits. Nonresponse to the shipment value or weight items is corrected by imputation. (See the "Imputation" section for a description of the imputation procedure.)

Shipment, quarter, and establishment nonresponse describe the inability to obtain any of the substantive measurements about a sampled shipment, quarter, or establishment, respectively. Shipment and quarter nonresponse are adjusted for by reweighting (see the descriptions of the shipment and quarter nonresponse weights in the "Estimation" section). 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 adjusted for during the estimation procedure by the nonresponse post-stratification adjustment weight. 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.

Response Rates

The CFS produces four different response rates: a participation response rate, a unit response rate, a weighted unit response rate, and a total quantity (item) response rate. The first three are based on the responses of the establishments selected into the survey. These unit response rates are shown in Table 17 (along with the final values from the 2012 survey).

Table 17.
2017 CFS Unit Response Rates

Type of response rate	Percent	
	2017 (final)	2012 (final)
Participation	57.9	57.0
Cooperation	71.5	X
Unit	63.0	66.1
Weighted unit	74.2	76.7

X Not applicable. A cooperation rate was not computed for the 2012 survey.

Note: Due to other missing data items, some of these shipments may not have been used in the final tabulations.

Table 18.
2017 CFS Total Quantity Response Rates

CFS variable	Percent	
	2017	2012
Value	50.6	51.9
Tons	47.4	50.9
Ton-miles[1]	55.7	63.2

[1] For ton-miles (which is the product of shipment weight and distance shipped) the distance shipped component is derived from the respondent-reported destination ZIP code (see the "Mileage Calculation" section). The respondent is not asked for the actual distance. This calculated distance is treated as equivalent-to-reported data for purposes of computing the TQRR for ton-miles.

Participation Response Rate (PRR)—The Participation Response Rate is the total number of unweighted establishments that provided usable[6] data divided by the total number of establishments in the sample (103,877) (expressed as a percentage).

Cooperation Rate—The Cooperation Rate is defined as the total number of unweighted establishments that provided shipment or other data to the CFS—whether or not such data was included in the estimates—divided by the sample size (and expressed as a percentage). It indicates the extent to which contacted establishments cooperated with the request to participate in the CFS.

Unit Response Rate (URR)—The Unit Response Rate is defined as the ratio (expressed as a percentage) of the total unweighted number of establishments that provided usable data to the total number of establishments that were eligible (or potentially eligible) for data collection. URRs are indicators of the performance of the data collection process in obtaining usable responses.

Weighted Unit Response Rate (WRR)—The Weighted Unit Response Rate is defined as the percentage of the total weighted sampling MOS of the establishments that provided usable data to the total weighted sampling MOS of all establishments that were eligible (or potentially eligible) for data collection. This incorporates the size of the establishment as well as its establishment (first-stage sample) weight into the measure of response.

The fourth rate is based on the quality of the individual shipment data reported by the responding establishments. These total quantity response rates for the 2017 CFS are shown in Table 18 (along with the final values from the 2012 survey).

Total Quantity Response Rate (TQRR)—The Total Quantity Response Rate is defined as the percentage of the estimated (weighted) total of a given data item (value, tons, or ton-miles) that is based on reported shipment data or from sources determined to be of equivalent-quality-to-reported data. The TQRR is an item-level indicator of the "quality" of each estimate. In contrast to the URR, these weighted response rates are computed for individual data items, so CFS produces several TQRRs.

The TQRR is the weighted proportion of the key estimates reported by responding establishments or obtained from equivalent quality sources. This measure incorporates the value of the individual shipment data items and the associated sampling and weighting factors.

DISCLOSURE AVOIDANCE

Disclosure is the release of data that have been deemed confidential. It generally reveals information about a specific individual or establishment or permits deduction of sensitive information about a particular individual or establishment. Disclosure avoidance is the process used to protect the confidentiality of the survey data provided by an individual or firm.

[6] "Usable data" means that an establishment provided at least one shipment that was used in the tabulation of published estimates.

Using disclosure avoidance procedures, the Census Bureau modifies or removes the characteristics that put confidential information at risk of disclosure. Although it may appear that a table shows information about a specific individual or business, the Census Bureau has taken steps to disguise or suppress the original data while making sure the results are still useful. The techniques used by the Census Bureau to protect confidentiality in tabulations vary, depending on the type of data.

For the CFS the primary method of disclosure avoidance is noise infusion. Noise infusion is a method of disclosure avoidance in which the weighted values for each shipment are perturbed prior to tabulation by applying a random noise multiplier to shipment value and weight. Disclosure protection is accomplished in a manner that causes the vast majority of cell values to be perturbed by at most a few percentage points. For sample-based tabulations, such as CFS, the estimated relative standard error for a published cell includes both the estimated sampling error and the amount of perturbation in the estimated cell value due to noise. Other cells in the table may be suppressed because the quality of the data does not meet publication standards. By far, the most common reason for suppressing a cell is a high coefficient of variation (greater than 50 percent). These suppressed cells are shown with an "S" in the tables.

The Census Bureau's Disclosure Review Board (DRB) approved the methodology used to protect the confidentiality of the statistics provided in this release (approval CBDRB-FY19-374) and the 2017 CFS Preliminary release (approval CBDRB-FY18-349).

COMPARABILITY OF ESTIMATES

This section summarizes the definitional, coding, and processing differences between the 2017 and 2012 (and prior) surveys that limit the comparability of the published statistics or estimates across the survey years. Data users should exercise caution when comparing CFS data across survey years.

Sample Size Changes

Table 19 summarizes the sampling frame and sample size changes for the most recent six surveys.

Industry Coverage Changes

Industry coverage has changed slightly from survey year to survey year (see Table 20). The details of the 2017 CFS industry coverage are described in the "Industry Coverage" section. The most significant recent changes are:

- NAICS 484 was included as an in-scope auxiliary industry in 2017 and 2012 but not any prior surveys.
- NAICS 51223 (Music publishers) was included as an in-scope publishing industry in 2017 but not in 2012.
- In 2012 and prior surveys, Prepress Services establishments (2007 NAICS 323122) were excluded from the CFS. However the 2012 NAICS revision eliminated Prepress Services as a separate industry and grouped it with Trade Binding and Related Work (2007 NAICS 323121) into NAICS 323120 (Support Activities for Printing). For 2017 all of NAICS 323120 was considered to be in scope.

The 2017 estimates were based on the industry classification of the sample establishments at the time those estimates were produced (May 2020). The 2012 and earlier estimates are never revised to account for subsequent industry classification changes to the sample establishments.

Table 19.
CFS Frame Sample Sizes

Sizes	Number of establishments in each CFS cycle					
	1993	1997	2002	2007	2012	2017
Sampling frame	790,000	770,000	760,000	753,699	716,114	710,498
Sample	197,176	102,739	51,005	102,369	102,565	103,877

Note: See the "CFS Industries" section for more information on coverage changes over the years.

Table 20.
Industry Coverage Changes

Survey years				
1993 and 1997	2002	2007	2012	2017
Establishments classified based on the 1987 Standard Industrial Classification (SIC) system	Establishments classified based on the 1997 North American Industry Classification System (NAICS)	Establishments classified based on the 2002 NAICS	Establishments classified based on 2007 NAICS	Establishments classified based on 2012 NAICS
Publishers were covered—classified in Manufacturing Division	Publishers (now in the Information sector) were not covered	Publishers (5111 and 51223) were covered[1]	Publishers (5111 only) were covered1	Publishers (5111 and 51223) were covered1
Logging covered—under Manufacturing Division	Logging not covered[2]	Logging not covered[2]	Logging not covered	Logging not covered
Other Manufacturing (excluding Printing Trade Services [SIC 279])	Manufacturing (excluding Prepress services [NAICS 323122])	Manufacturing (excluding Prepress services [NAICS 323122])	Manufacturing (excluding Prepress Services [NAICS 323122])	Manufacturing (all industries)
Mining (except mining services [SICs 108, 124, 138, 148] and oil and gas extraction [SICs 131 and 132])	Mining (except support activities [NAICS 213] and oil and gas extraction [NAICS 211])	Mining (except support activities [NAICS 213] and oil and gas extraction [NAICS 211])	Mining (except support activities [NAICS 213] and oil and gas extraction [NAICS 211])	Mining (except support activities [NAICS 213] and oil and gas extraction [NAICS 211])
Wholesale (merchants and manufacturers' sales branches and government-owned liquor stores)	Wholesale (merchants and manufacturers' sales branches and government-owned liquor stores)	Wholesale (merchants and manufacturers' sales branches and government-owned liquor stores)	Wholesale (merchants and manufacturers' sales branches and own brand importers)	Wholesale (merchants and manufacturers' sales branches and own brand importers)
Retail—catalog and mail-order houses	Retail—electronic shopping and mail-order houses	Retail—electronic shopping, mail-order houses, fuel dealers	Retail—electronic shopping, mail-order houses, fuel dealers	Retail—electronic shopping and mail-order houses, fuel dealers
Auxiliaries (managing offices, warehouses)	Auxiliaries (managing offices, warehouses)	Auxiliaries (managing offices, warehouses)[3]	Auxiliaries (managing offices, warehouses and trucking)[3]	Auxiliaries (managing offices, warehouses and trucking)[3]

[1] Under NAICS, publishers were reclassified from Manufacturing (SIC 2711, 2721, 2731, 2741, and part of 2771) to Information (NAICS 5111 and 51223) and were excluded in the 2002 CFS. In 2007 and later surveys, Music Publishers (NAICS 51223) were tabulated and published in Newspaper, Periodical, Book and Directory Publishers (NAICS 5111). However, for the 2012 cycle, NAICS 51223 was not sampled.

[2] Because of changes in the classification of establishments between SIC and NAICS, logging establishments (NAICS 1133), which were covered as part of Manufacturing in the 1993 and 1997 surveys, were not included in 2002 and later surveys. Detailed information about NAICS classification can be found on the Census Bureau's NAICS Web site at <www.census.gov/eos/www/naics/>.

[3] While included in all surveys, the procedures for identifying in-scope auxiliary establishments have changed over the years:

1997 CFS: a managing office was considered in scope only if it had sales or end-of-year inventories in the 1992 Census. Research conducted prior to the 2002 CFS showed that not all managing offices with shipping activity in the 1997 CFS indicated sales or inventories in the 1997 Economic Census. Consequently, the 1997 Economic Census results were not used to determine scope for managing offices in the 2002 CFS.

2002 CFS: an auxiliary was included if it supported an in-scope or retail company.

2007 CFS: an Advance Survey of approximately 40,000 auxiliary establishments was conducted in 2006 to identify those auxiliary establishments with shipping activity. Those that indicated that shipping was performed (as well as nonrespondents) were included in the CFS sample universe.

2012 CFS: a targeted Advance Survey of approximately 100,000 establishments was conducted in 2011 to identify those establishments that actually conduct shipping activities. In general, though not always, surveyed establishments that reported that they did not conduct any shipping activity were excluded from the eventual CFS sampling frame.

2017 CFS: a targeted Advance Survey of approximately 150,000 establishments was conducted in 2016 to identify those establishments that actually conduct shipping activities. In general, though not always, surveyed establishments that reported that they did not conduct any shipping activity were excluded from the eventual CFS sampling frame.

Changes to Data Items Collected

Table 21 summarizes the shipment data items requested from each sampled establishment in a reporting period (usually one week) for the past six surveys.

Table 22 summarizes the establishment-level data collected from each sampled establishment (generally each quarter).

Geographic Area Changes

No new CFS Areas were defined for the 2017 CFS. However, some CFS Areas, while similar in name from one survey to the next, are actually made up of slightly different sets of counties. For example, in 2012, the Dallas-Fort Worth, TX CFS Area consisted of 19 counties. In 2017, the Dallas-Fort Worth, TX-OK CFS Area (TX Part) was made up of 20 counties in Texas. Consequently, as a result of this change to the Dallas-Fort Worth CFS Area, the number of counties included in the Remainder of Texas CFS Area was reduced. Table 23 lists the CFS Areas that changed from 2012 to 2017.

Mode Changes

There have been slight changes to the definitions of the modes of transportation requested from respondents over the years. These are summarized in Table 24.

Table 21.
Data Items Collected for Each Shipment

Data item	Survey years			
	1993	1997	2002, 2007	2012, 2017
Company shipment ID	C	C	C	C
Shipment date	C	C	C	C
Total value	C	C	C	C
Total weight	C	C	C	C
Commodity code	STCC[1]	SCTG[2]	SCTG	SCTG
Commodity description	C	C	C	C
Mode of transport to U.S. destination	C	C	C	C
Domestic destination (city, state, and ZIP)	C	C	C	C
Containerized? (Y/N)	C	C	X	X
Intermodal shipment? (Y/N)	X	X	C	X
Temperature controlled? (Y/N)	X	X	X	C
Hazardous material? (Y/N)	C	X	X	X
HAZMAT (UN/NA) code	X	C	C	C
Export? (Y/N)	C	C	C	C
Export destination (city, country)	C	C	C	C
Export mode	C	C	C	C

C Data collected.
X Not applicable; data not collected.
[1] STCC Standard Transportation Commodity Code.
[2] SCTG Standard Classification Transported Goods.

Table 22.
Data Items Collected From Each Establishment
(Each Reporting Period)

Data item	Survey years				
	1993	1997, 2002	2007	2012	2017
Verification of shipping address	C	C	C	C	C
Verification of mailing address	X	X	X	C	C
Operating status	C	C	C	C	C
Length of reporting period (weeks)	2	1	1	1	1
Total number of outbound shipments for the reporting period	C	C	C	C	C
Total value of weekly shipments	X	X	X	X	C
Monthly value of outbound shipment	C	C	C	C	X
Third party logistics (3PL) usage[1]	X	X	C	X	X
Rush delivery usage	X	X	X	C	X
Primary activity correct? (Y/N)	X	X	X	X	C
Time to complete (paper) survey (Hrs, Min)	X	X	X	X	C
Contact information	C	C	C	C	C

C Data item collected in survey year.
X Not applicable; data not collected.
[1] Only collected on the 4th quarter questionnaire.

Table 23.
CFS Area Definition Changes for 2017

2017 CFS Area		2012 CFS Area		Description of change[1]
142	Birmingham-Hoover-Talladega, AL	142	Birmingham-Hoover-Talladega, AL	Tallapoosa County, AL, added to the CFS Area
206	Dallas-Fort Worth, TX-OK (TX part)	206	Dallas-Fort Worth, TX	Fannin County, TX, added to the CFS Area
324	Lake Charles-Jennings, LA	29340	Lake Charles, LA	Jefferson Davis Parish, LA, added to the CFS Area

[1] The Alabama, Texas, and Louisiana ROS CFS Areas lost the counties added to the CFS Areas described above

Table 24.
Reported Modes of Transportation

Survey year			
1993	1997, 2002, and 2007	2012	2017
For-hire truck	For-hire truck	For-hire truck	For-hire truck
Private truck	Private truck	Private truck	Company-owned truck
Rail	Rail	Rail	Rail
Air	Air	Air	Air
Inland water	Shallow draft	Inland water	Inland water
Deep sea water	Deep draft vessel	Deep sea	Deep sea
Pipeline	Pipeline	Pipeline	Pipeline
Parcel, U.S. Postal Service, or courier	Parcel, U.S. Postal Service, or courier	Parcel, U.S. Postal Service, or courier	Parcel, U.S. Postal Service, or courier
Other	Other	Other	Other
Unknown	Unknown	Unknown	Unknown

As shown in Table 24, the 2012 mode category “private truck” was renamed “company-owned truck” for 2017.

There were no changes to the published detailed mode of transportation codes associated with waterborne shipments between 2012 and 2017. Table 25 lists the published water modes in 2007, 2012, and 2017. See the 2007, 2012, and 2017 questionnaires and instruction guides at <www.census.gov/programs-surveys/cfs/technical-documentation/questionnaires.html> for descriptions of these modes.

Table 25.
Published Water Mode Codes

2007		2012, 2017	
Code	Meaning	Code	Meaning
07	Water	07	Water
08	Shallow draft	08	Inland water
09	Great Lakes	09	Great Lakes
10	Deep draft	10	Deep sea
		101	Multiple waterways

In 2012, export shipments that traveled by a single mode (truck, for example) to the Port of Exit (POE) and then by ship to their foreign destinations were classified as single-mode (truck, in this example) shipments and their domestic water mileage to the U.S. territorial border was not included. In 2017, these shipments are classified as multi-mode truck and water shipments and include the domestic water mileage to the U.S. territorial boundary.

Routing Software Changes

The following methodological changes to mileage processing, implemented in 2012 and carried over to 2017, also affected mode assignment (and the shipment distance calculations).

- The maximum weight of a parcel shipment was limited to 150 pounds in 2012 and 2017. In 2007, the limit was 1,000 pounds. Shipments with weights above the maximum were reassigned to a non-parcel mode, usually a truck mode.
- In 2012 and 2017, there was no minimum restriction on the weight of an air shipment. In 2007, air shipments with a weight of less than 100 pounds were reclassified as parcel.
- Company-owned truck shipments ("private truck" in 2012) were not routed more than 500 miles during 2012 and 2017 mileage calculation as this form of in-house transportation is generally "short haul" in nature. In 2007, there was no mileage limit.
- In 2012 and 2017, there were major efforts to re-code shipments, where a respondent provided a mode of "other" or "unknown," to one of the more descriptive modes. For these type shipments in 2007, "other" and "unknown" modes were generally acceptable. During the 2012 and 2017 CFS mileage calculation operations, a review of these "other mode" shipments was conducted. This analysis showed there to be few truly "other mode" shipments. Such shipments were often transported via conveyor belts. Table 26 compares the value and tonnage estimates for the other-type modes in the 2007, 2012, and 2017 releases.
- The reduction in the "other multiple modes" totals in 2012 was largely due to the addition of the "multiple waterways" mode category in 2012. In 2007, these shipments (with two or more water modes) would have been classified into "other multiple modes." The increase in "other multiple modes" in 2017 is largely the result of including the U.S. territorial water portion of an export shipment as a domestic mode. For example, export shipments that traveled by truck and rail to a sea port of exit were classified as (domestic) "truck and rail" shipments in 2012. In 2017, these shipments now had three domestic legs (truck, rail, and water) and so were classified into "other multiple modes." See Table 26.

Table 26.
Other Modes of Transportation

Mode code	Mode meaning	2007 (final)		2012 (final)		2017 (final)	
		Value (million dollars)	Tons (thousands)	Value (million dollars)	Tons (thousands)	Value (million dollars)	Tons (thousands)
18	Other multiple modes	45,320	113,841	668	2,452	17,490	8,224
19	Other modes	279,113	271,567	1,026	36,844	2,095	93,634

More details about mileage calculation and related processing can be found in the "Mileage Calculation" section.

Commodity Coding Changes

Several commodities in SCTGs 07, 08, 17, and 18 were redefined in 2012. For the details of these changes, see the "Commodity Coding Changes for 2012" table in the "Data Collection" section of the "2012 CFS Survey Methodology" at <www.census.gov/programs-surveys/cfs/technical-documentation/methodology/methodology-2012.html>. The codes used to display some of these commodities changed for 2017. See Table 8 for the details.

As described in the "Imputation" section, several new processes were developed to impute commodity and HAZMAT codes for 2017.

Application of Noise Infusion

For establishments that were in the survey in both 2017 and 2012, no effort was made to coordinate the direction or magnitude of the noise factor applied to these establishments from one survey to the next. For such an establishment, the random noise multiplier may have been greater than 1.0 in 2017 but less than 1.0 in 2012 or vice versa. See the "Disclosure Avoidance" section for more details.

Sampling Variability and Nonresponse

Through its sample design, the CFS tries to ensure the sample will include shipments originating from establishments in each CFS Area. However, estimates of other shipment characteristics, such as destination, commodity, and mode, depend entirely on the sample of shipments reported by responding establishments. See the "Sample Design" section for further information.

A particular combination of origin, destination, commodity, and mode (for example) may be common one year but rare or nonexistent in the next survey. While this may reflect true changes in economic activity, it may also result from one of the following:

- Failing to include in the 2017 CFS sample, the establishments making these shipments.
- If included, the sampled establishments failing to respond in 2017.
- If responding, failing to include shipments with this particular combination of characteristics in the sample of shipments provided to the Census Bureau.

Estimation

As discussed in the "Estimation" section, the CFS weighting methodology makes use of Economic Census data. At the time they were needed for the 2012 CFS, not all of these 2012 Census data were final so some of the 2012 Census estimates relied upon by the CFS may have been changed after the 2012 CFS estimates were released. No attempt has been made to revise or reweight the 2012 CFS data to account for these subsequent changes.

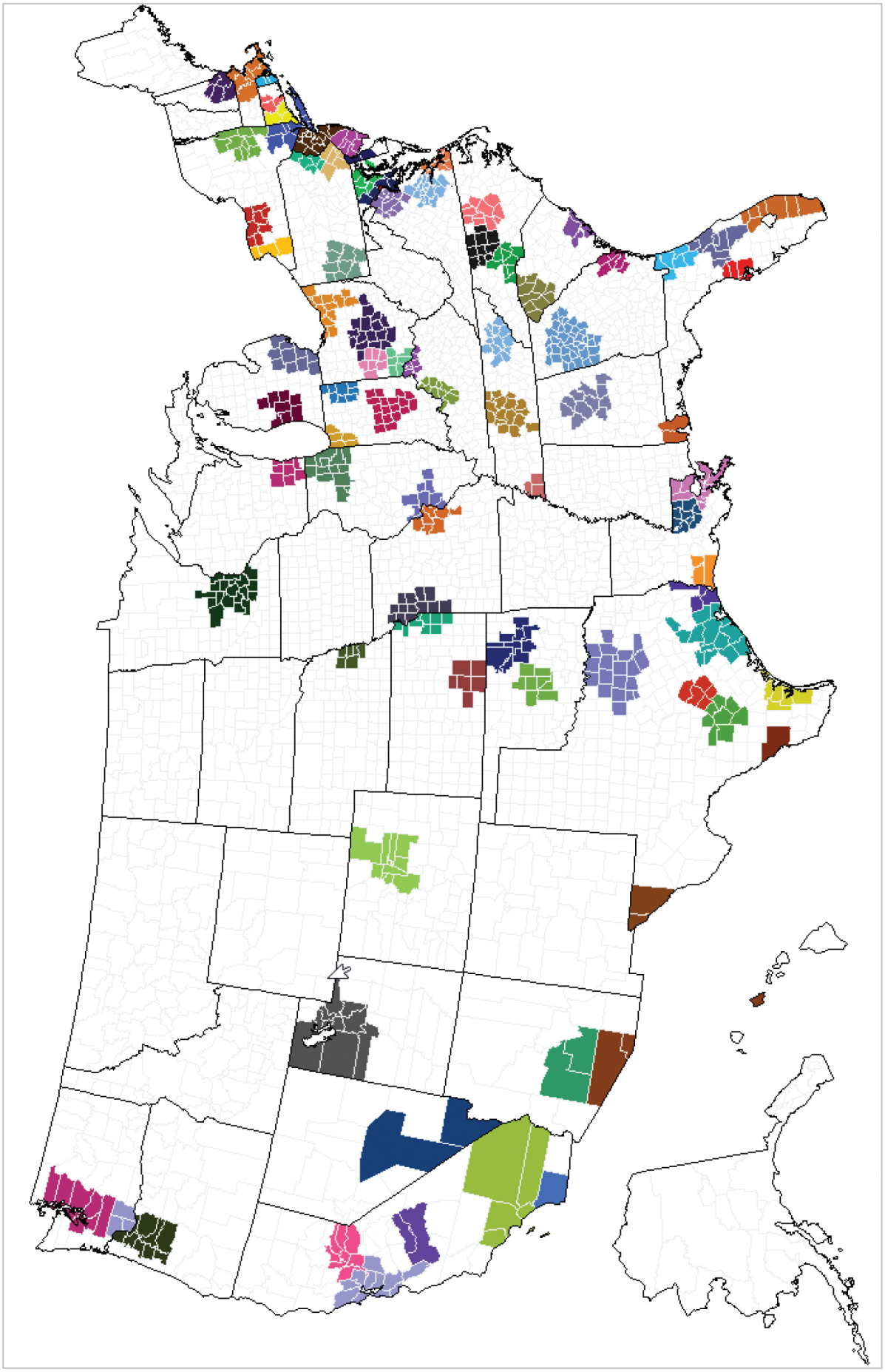

Figure 1.
Map of 2017 CFS Areas

Note: Remainder of State (ROS) CFS Areas are shown in white. See legend on next page.

Listing of 2017 CFS Areas

ST	CFS Area Code	CFS Area Description	Map Color
AL	142	Birmingham-Hoover-Talladega, AL CFS Area	
AL	380	Mobile-Daphne-Fairhope, AL CFS Area	
AZ	38060	Phoenix-Mesa-Scottsdale, AZ CFS Area	
AZ	536	Tucson-Nogales, AZ CFS Area	
CA	260	Fresno-Madera, CA CFS Area	
CA	348	Los Angeles-Long Beach, CA CFS Area	
CA	41740	San Diego-Carlsbad, CA CFS Area	
CA	472	Sacramento-Roseville, CA CFS Area	
CA	488	San Jose-San Francisco-Oakland, CA CFS Area	
CO	216	Denver-Aurora, CO CFS Area	
CT	25540	Hartford-West Hartford-East Hartford, CT CFS Area	
CT	408	New York-Newark, NY-NJ-CT-PA CFS Area (CT Part)	
DE	428	Philadelphia-Reading-Camden, PA-NJ-DE-MD CFS Area (DE Part)	
DC	47900	Washington-Arlington-Alexandria, DC-VA-MD-WV CFS Area (DC Part)	
FL	300	Jacksonville-St. Marys-Palatka, FL-GA CFS Area (FL Part)	
FL	370	Miami-Fort Lauderdale-Port St. Lucie, FL CFS Area	
FL	422	Orlando-Deltona-Daytona Beach, FL CFS Area	
FL	45300	Tampa-St. Petersburg-Clearwater, FL CFS Area	
GA	122	Atlanta-Athens-Clarke County-Sandy Springs, GA CFS Area	
GA	496	Savannah-Hinesville-Statesboro, GA CFS Area	
HI	46520	Urban Honolulu, HI CFS Area	
IL	176	Chicago-Naperville, IL-IN-WI CFS Area (IL Part)	
IL	476	St. Louis-St. Charles-Farmington, MO-IL CFS Area (IL Part)	
IN	176	Chicago-Naperville, IL-IN-WI CFS Area (IN Part)	
IN	258	Fort Wayne-Huntington-Auburn, IN CFS Area	
IN	294	Indianapolis-Carmel-Muncie, IN CFS Area	
KS	312	Kansas City-Overland Park-Kansas City, MO-KS CFS Area (KS Part)	
KS	556	Wichita-Arkansas City-Winfield, KS CFS Area	
KY	178	Cincinnati-Wilmington-Maysville, OH-KY-IN CFS Area (KY Part)	
KY	350	Louisville/Jefferson County-Elizabethtown-Madison, KY-IN CFS Area (KY Part)	
LA	12940	Baton Rouge, LA CFS Area	
LA	324	Lake Charles-Jennings, LA CFS Area	
LA	406	New Orleans-Metairie-Hammond, LA-MS CFS Area (LA Part)	
MD	12580	Baltimore-Columbia-Towson, MD CFS Area	
MD	47900	Washington-Arlington-Alexandria, DC-VA-MD-WV CFS Area (MD Part)	
MA	148	Boston-Worcester-Providence, MA-RI-NH-CT CFS Area (MA Part)	
MI	220	Detroit-Warren-Ann Arbor, MI CFS Area	
MI	266	Grand Rapids-Wyoming-Muskegon, MI CFS Area	
MN	378	Minneapolis-St. Paul, MN-WI CFS Area (MN Part)	
MO	312	Kansas City-Overland Park-Kansas City, MO-KS CFS Area (MO Part)	
MO	476	St. Louis-St. Charles-Farmington, MO-IL CFS Area (MO Part)	
NE	420	Omaha-Council Bluffs-Fremont, NE-IA CFS Area (NE Part)	
NV	332	Las Vegas-Henderson, NV-AZ CFS Area (NV Part)	

ST	CFS Area Code	CFS Area Description	Map Color
NH	148	Boston-Worcester-Providence, MA-RI-NH-CT CFS Area (NH Part)	
NJ	408	New York-Newark, NY-NJ-CT-PA CFS Area (NJ Part)	
NJ	428	Philadelphia-Reading-Camden, PA-NJ-DE-MD CFS Area (NJ Part)	
NY	104	Albany-Schenectady, NY CFS Area	
NY	160	Buffalo-Cheektowaga, NY CFS Area	
NY	408	New York-Newark, NY-NJ-CT-PA CFS Area (NY Part)	
NY	464	Rochester-Batavia-Seneca Falls, NY CFS Area	
NC	172	Charlotte-Concord, NC-SC CFS Area (NC Part)	
NC	268	Greensboro-Winston-Salem-High Point, NC CFS Area	
NC	450	Raleigh-Durham-Chapel Hill, NC CFS Area	
OH	178	Cincinnati-Wilmington-Maysville, OH-KY-IN CFS Area (OH Part)	
OH	184	Cleveland-Akron-Canton, OH CFS Area	
OH	198	Columbus-Marion-Zanesville, OH CFS Area	
OH	212	Dayton-Springfield-Sidney, OH CFS Area	
OK	416	Oklahoma City-Shawnee, OK CFS Area	
OK	538	Tulsa-Muskogee-Bartlesville, OK CFS Area	
OR	440	Portland-Vancouver-Salem, OR-WA CFS Area (OR Part)	
PA	408	New York-Newark, NY-NJ-CT-PA CFS Area (PA Part)	
PA	428	Philadelphia-Reading-Camden, PA-NJ-DE-MD CFS Area (PA Part)	
PA	430	Pittsburgh-New Castle-Weirton, PA-OH-WV CFS Area (PA Part)	
RI	148	Boston-Worcester-Providence, MA-RI-NH-CT CFS Area (RI Part)	
SC	16700	Charleston-North Charleston, SC CFS Area	
SC	273	Greenville-Spartanburg-Anderson, SC CFS Area	
TN	314	Knoxville-Morristown-Sevierville, TN CFS Area	
TN	368	Memphis-Forrest City, TN-MS-AR CFS Area (TN Part)	
TN	400	Nashville-Davidson-Murfreesboro, TN CFS Area	
TX	12420	Austin-Round Rock, TX CFS Area	
TX	13140	Beaumont-Port Arthur, TX CFS Area	
TX	204	Corpus Christi-Kingsville-Alice, TX CFS Area	
TX	206	Dallas-Fort Worth, TX-OK CFS Area (TX Part)	
TX	238	El Paso-Las Cruces, TX-NM CFS Area (TX Part)	
TX	288	Houston-The Woodlands, TX CFS Area	
TX	29700	Laredo, TX CFS Area	
TX	41700	San Antonio-New Braunfels, TX CFS Area	
UT	482	Salt Lake City-Provo-Orem, UT CFS Area	
VA	40060	Richmond, VA CFS Area	
VA	47900	Washington-Arlington-Alexandria, DC-VA-MD-WV CFS Area (VA Part)	
VA	545	Virginia Beach-Norfolk, VA-NC CFS Area (VA Part)	
WA	440	Portland-Vancouver-Salem, OR-WA CFS Area (WA Part)	
WA	500	Seattle-Tacoma, WA CFS Area	
WI	376	Milwaukee-Racine-Waukesha, WI CFS Area	
XX	99999	Remainder of State XX (where "XX" is the state postal code)	

Geographic Area Series

Table A1a.

Shipment Characteristics by Mode of Transportation for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Mode of transportation	Value		Tons		Ton-miles[1]		Average miles per shipment
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
All modes	**14,517,812**	**100.0**	**12,468,902**	**100.0**	**3,116,876**	**100.0**	**679**
Single modes	**11,737,969**	**80.9**	**11,604,764**	**93.1**	**2,479,593**	**79.6**	**243**
Truck[2]	10,398,910	71.6	8,843,334	70.9	1,327,094	42.6	206
For-hire truck	6,968,184	48.0	5,232,034	42.0	1,162,179	37.3	369
Company-owned truck	3,430,726	23.6	3,611,300	29.0	164,915	5.3	45
Rail	254,209	1.8	1,251,240	10.0	824,763	26.5	579
Water	243,855	1.7	804,392	6.5	259,610	8.3	259
Inland water	117,321	0.8	471,854	3.8	177,494	5.7	188
Great Lakes	614	Z	41,947	0.3	15,638	0.5	304
Deep sea	120,651	0.8	268,634	2.2	50,866	1.6	359
Multiple waterways	5,268	Z	21,958	0.2	15,612	0.5	525
Air (includes truck and air)	496,637	3.4	8,019	0.1	9,822	0.3	1,403
Pipeline[3]	344,357	2.4	697,778	5.6	S	S	S
Multiple modes	**2,777,749**	**19.1**	**770,504**	**6.2**	**637,155**	**20.4**	**953**
Parcel, U.S. Postal Service, or courier	2,117,135	14.6	38,008	0.3	29,838	1.0	953
Truck and rail	348,047	2.4	471,398	3.8	443,188	14.2	1,177
Truck and water	251,439	1.7	109,861	0.9	51,853	1.7	784
Rail and water	43,638	0.3	143,013	1.1	102,715	3.3	1,075
Other multiple modes	17,490	0.1	8,224	0.1	9,562	0.3	1,425
Other modes	**2,095**	**Z**	**93,634**	**0.8**	**128**	**Z**	**1**

S Withheld because estimate did not meet publication standards.
Z Rounds to zero.
[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[2] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.
[3] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).
Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table A1b.

Shipment Characteristics by Mode of Transportation for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

Mode of transportation	Value			Tons			Ton-miles[1]			Average miles per shipment		
	2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
All modes	**14,517,812**	**13,852,143**	**4.8**	**12,468,902**	**11,299,409**	**10.4**	**3,116,876**	**2,969,506**	**5.0**	**679**	**630**	**7.9**
Single modes	**11,737,969**	**11,900,364**	**–1.4**	**11,604,764**	**10,905,518**	**6.4**	**2,479,593**	**2,697,418**	**–8.1**	**243**	**262**	**–7.5**
Truck[2]	10,398,910	10,132,229	2.6	8,843,334	8,060,166	9.7	1,327,094	1,247,717	6.4	206	227	–9.2
For-hire truck	6,968,184	6,504,636	7.1	5,232,034	4,298,693	21.7	1,162,179	1,050,942	10.6	369	508	–27.3
Company-owned truck	3,430,726	3,627,592	–5.4	3,611,300	3,761,472	–4.0	164,915	196,775	–16.2	45	58	–21.6
Rail	254,209	473,070	–46.3	1,251,240	1,628,537	–23.2	824,763	1,211,481	–31.9	579	805	–28.0
Water	243,855	301,554	–19.1	804,392	575,996	39.7	259,610	192,866	34.6	259	908	–71.4
Inland water	117,321	218,927	–46.4	471,854	424,542	11.1	177,494	118,742	49.5	188	275	–31.5
Great Lakes	614	424	44.7	41,947	31,403	33.6	15,638	10,959	42.7	304	347	–12.5
Deep sea	120,651	59,878	101.5	268,634	72,987	268.1	50,866	22,130	129.9	359	1,157	–69.0
Multiple waterways	5,268	22,325	–76.4	21,958	47,064	–53.3	15,612	41,035	–62.0	525	1,034	–49.2
Air (includes truck and air)	496,637	450,575	10.2	8,019	4,845	65.5	9,822	5,810	69.0	1,403	1,295	8.4
Pipeline[3]	344,357	542,936	–36.6	697,778	635,975	9.7	S	S	S	S	S	S
Multiple modes	**2,777,749**	**1,950,753**	**42.4**	**770,504**	**357,047**	**115.8**	**637,155**	**271,832**	**134.4**	**953**	**922**	**3.4**
Parcel, U.S. Postal Service, or courier	2,117,135	1,688,242	25.4	38,008	28,490	33.4	29,838	22,716	31.4	953	922	3.4
Truck and rail	348,047	224,833	54.8	471,398	213,814	120.5	443,188	169,524	161.4	1,177	988	19.1
Truck and water	251,439	29,035	766.0	109,861	56,720	93.7	51,853	48,568	6.8	784	1,562	–49.8
Rail and water	43,638	7,976	447.1	143,013	55,570	157.4	102,715	29,170	252.1	1,075	1,073	0.2
Other multiple modes	17,490	668	2520.0	8,224	2,452	235.4	9,562	1,853	416.0	1,425	S	S
Other modes	**2,095**	**1,026**	**104.2**	**93,634**	**36,844**	**154.1**	**128**	**256**	**–50.1**	**1**	**S**	**S**

S Withheld because estimate did not meet publication standards.
[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[2] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.
[3] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).
Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table A2a.

Shipment Characteristics by Total Modal Activity for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Mode of transportation[1]	Ton-miles[2]		Average miles per shipment
	2017 (millions)	Percent of total	
Total	**3,116,876**	**100.0**	**662**
Truck[3]	1,371,732	44.0	203
Rail	1,328,603	42.6	956
Inland water	201,413	6.5	380
Great Lakes	39,190	1.3	485
Deep sea	78,334	2.5	99
Air	9,573	0.3	881
Pipeline[4]	S	S	S
Parcel, U.S. Postal Service, or courier	29,599	0.9	945
Other modes	128	Z	1

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Estimates represent activity for a given mode across single and multiple mode shipments. For example, "Truck" ton-miles includes total ton-miles for shipments moving only by truck plus ton-miles for truck segments of multiple mode shipments.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[4] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table A2b.

Shipment Characteristics by Total Modal Activity for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

Mode of transportation[1]	Ton-miles[2]			Average miles per shipment		
	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
Total	**3,116,876**	**2,969,506**	**5.0**	**662**	**611**	**8.3**
Truck[3]	1,371,732	1,255,146	9.3	203	223	-8.8
Rail	1,328,603	1,387,777	-4.3	956	878	8.9
Inland water	201,413	162,983	23.6	380	340	11.8
Great Lakes	39,190	31,931	22.7	485	414	17.1
Deep sea	78,334	65,262	20.0	99	1,277	-92.2
Air	9,573	4,118	132.5	881	790	11.4
Pipeline[4]	S	S	S	S	S	S
Parcel, U.S. Postal Service, or courier	29,599	22,490	31.6	945	910	3.8
Other modes	128	256	-50.1	1	S	S

S Withheld because estimate did not meet publication standards.

[1] Estimates represent activity for a given mode across single and multiple mode shipments. For example, "Truck" ton-miles includes total ton-miles for shipments moving only by truck plus ton-miles for truck segments of multiple mode shipments.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[4] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table A3a.

Shipment Characteristics by Distance Shipped for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Distance shipped[1] (Based on Great Circle Distance)	Value		Tons		Ton-miles[2]	
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total
Total	**14,517,812**	**100.0**	**12,468,902**	**100.0**	**3,116,876**	**100.0**
Less than 50 miles	5,131,422	35.3	7,216,222	57.9	155,957	5.0
50 to 99 miles	1,425,635	9.8	1,281,601	10.3	124,488	4.0
100 to 249 miles	2,215,380	15.3	1,422,529	11.4	321,576	10.3
250 to 499 miles	1,836,093	12.6	971,753	7.8	478,022	15.3
500 to 749 miles	1,186,351	8.2	615,771	4.9	537,764	17.3
750 to 999 miles	828,211	5.7	416,467	3.3	504,575	16.2
1,000 to 1,499 miles	837,891	5.8	391,096	3.1	626,890	20.1
1,500 to 1,999 miles	572,278	3.9	97,096	0.8	212,017	6.8
2,000 miles or more	484,552	3.3	56,366	0.5	155,588	5.0

[1] Shipments are grouped into distance categories based on Great Circle Distance (GCD). GCD is the shortest distance between two points on the surface of a sphere over the surface of that sphere.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table A3b.

Shipment Characteristics by Distance Shipped for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

Distance shipped[1] (Based on Great Circle Distance)	Value			Tons			Ton-miles[2]		
	2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change
Total	**14,517,812**	**13,852,143**	**4.8**	**12,468,902**	**11,299,409**	**10.4**	**3,116,876**	**2,969,506**	**5.0**
Less than 50 miles	5,131,422	4,995,112	2.7	7,216,222	6,315,527	14.3	155,957	122,912	26.9
50 to 99 miles	1,425,635	1,356,710	5.1	1,281,601	1,139,713	12.4	124,488	104,942	18.6
100 to 249 miles	2,215,380	2,111,969	4.9	1,422,529	1,338,823	6.3	321,576	297,268	8.2
250 to 499 miles	1,836,093	1,735,174	5.8	971,753	949,748	2.3	478,022	460,993	3.7
500 to 749 miles	1,186,351	1,134,327	4.6	615,771	591,737	4.1	537,764	514,223	4.6
750 to 999 miles	828,211	796,942	3.9	416,467	446,299	–6.7	504,575	525,243	–3.9
1,000 to 1,499 miles	837,891	810,449	3.4	391,096	362,909	7.8	626,890	567,159	10.5
1,500 to 1,999 miles	572,278	489,495	16.9	97,096	105,065	–7.6	212,017	238,211	–11.0
2,000 miles or more	484,552	421,964	14.8	56,366	49,589	13.7	155,588	138,555	12.3

[1] Shipments are grouped into distance categories based on Great Circle Distance (GCD). GCD is the shortest distance between two points on the surface of a sphere over the surface of that sphere.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table A4a.

Shipment Characteristics by Shipment Weight for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Shipment weight	Value		Tons		Ton-miles[1]		Average miles per shipment
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
Total	**14,517,812**	**100.0**	**12,468,902**	**100.0**	**3,116,876**	**100.0**	**679**
Less than 50 lbs	2,434,530	16.8	41,489	0.3	24,347	0.8	785
50 to 99 lbs	541,127	3.7	24,051	0.2	8,212	0.3	345
100 to 499 lbs	1,353,537	9.3	124,023	1.0	30,152	1.0	254
500 to 749 lbs	392,893	2.7	60,745	0.5	12,245	0.4	203
750 to 999 lbs	278,578	1.9	53,858	0.4	10,379	0.3	193
1,000 to 9,999 lbs	2,974,218	20.5	840,108	6.7	181,083	5.8	206
10,000 to 49,999 lbs	4,549,603	31.3	5,058,162	40.6	996,994	32.0	199
50,000 to 99,999 lbs	884,477	6.1	2,854,883	22.9	257,874	8.3	89
100,000 lbs or more	1,108,850	7.6	3,411,583	27.4	1,595,590	51.2	654

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table A4b.

Shipment Characteristics by Shipment Weight for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

Shipment weight	Value			Tons			Ton-miles[1]			Average miles per shipment		
	2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
Total	**14,517,812**	**13,852,143**	**4.8**	**12,468,902**	**11,299,409**	**10.4**	**3,116,876**	**2,969,506**	**5.0**	**679**	**630**	**7.9**
Less than 50 lbs	2,434,530	1,834,685	32.7	41,489	31,186	33.0	24,347	18,170	34.0	785	738	6.3
50 to 99 lbs	541,127	449,065	20.5	24,051	17,511	37.4	8,212	6,774	21.2	345	389	–11.2
100 to 499 lbs	1,353,537	1,174,345	15.3	124,023	96,778	28.2	30,152	26,972	11.8	254	291	–12.8
500 to 749 lbs	392,893	356,543	10.2	60,745	49,115	23.7	12,245	11,429	7.1	203	233	–13.0
750 to 999 lbs	278,578	260,051	7.1	53,858	42,923	25.5	10,379	9,054	14.6	193	211	–8.4
1,000 to 9,999 lbs	2,974,218	2,563,775	16.0	840,108	700,842	19.9	181,083	158,537	14.2	206	221	–6.7
10,000 to 49,999 lbs	4,549,603	4,614,596	–1.4	5,058,162	4,480,995	12.9	996,994	877,905	13.6	199	198	0.3
50,000 to 99,999 lbs	884,477	1,049,816	–15.7	2,854,883	2,227,930	28.1	257,874	180,287	43.0	89	79	12.3
100,000 lbs or more	1,108,850	1,549,267	–28.4	3,411,583	3,652,128	–6.6	1,595,590	1,680,378	–5.0	654	577	13.3

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table A5a.

Shipment Characteristics by Two-Digit Commodity for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value		Tons		Ton-miles[1]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
	All commodities[2]	**14,517,812**	**100.0**	**12,468,902**	**100.0**	**3,116,876**	**100.0**	**679**
01	Live animals and live fish	10,777	0.1	4,573	Z	1,570	0.1	866
02	Cereal grains (includes seed)	108,561	0.7	707,113	5.7	230,498	7.4	158
03	Agricultural products (excludes animal feed, cereal grains, and forage products)	236,965	1.6	315,168	2.5	145,852	4.7	524
04	Animal feed, eggs, honey, and other products of animal origin	134,423	0.9	325,312	2.6	78,947	2.5	514
05	Meat, poultry, fish, seafood, and their preparations	356,421	2.5	93,872	0.8	46,001	1.5	183
06	Milled grain products and preparations and bakery products	198,051	1.4	132,818	1.1	56,404	1.8	187
07	Other prepared foodstuffs and fats and oils	606,280	4.2	530,168	4.3	203,307	6.5	373
08	Alcoholic beverages, and denatured alcohol	226,894	1.6	111,861	0.9	27,798	0.9	195
09	Tobacco products	79,806	0.5	4,659	Z	877	Z	1,014
10	Monumental or building stone	7,193	Z	14,072	0.1	2,474	0.1	345
11	Natural sands	12,211	0.1	535,935	4.3	112,790	3.6	170
12	Gravel and crushed stone (excludes dolomite and slate)	19,664	0.1	1,615,187	13.0	95,990	3.1	41
13	Other nonmetallic minerals, n.e.c.	24,581	0.2	216,583	1.7	57,099	1.8	274
14	Metallic ores and concentrates	30,734	0.2	70,510	0.6	44,267	1.4	607
15	Coal	31,673	0.2	878,235	7.0	483,112	15.5	74
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	745,954	5.1	1,388,364	11.1	138,279	4.4	44
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	474,617	3.3	909,140	7.3	79,304	2.5	36
19	Other coal and petroleum products, n.e.c.	258,447	1.8	547,120	4.4	88,371	2.8	65
20	Basic chemicals	290,944	2.0	418,746	3.4	151,553	4.9	421
21	Pharmaceutical products	1,099,027	7.6	19,569	0.2	10,129	0.3	623
22	Fertilizers	57,886	0.4	172,509	1.4	40,112	1.3	102
23	Chemical products and preparations, n.e.c.	431,214	3.0	127,478	1.0	60,718	1.9	881
24	Plastics and rubber	642,524	4.4	224,812	1.8	123,629	4.0	689
25	Logs and other wood in the rough	6,508	Z	25,637	0.2	5,411	0.2	138
26	Wood products	220,916	1.5	322,769	2.6	88,755	2.8	350
27	Pulp, newsprint, paper, and paperboard	127,501	0.9	139,603	1.1	83,375	2.7	267
28	Paper or paperboard articles	148,420	1.0	80,854	0.6	26,305	0.8	577
29	Printed products	133,862	0.9	27,940	0.2	11,119	0.4	480
30	Textiles, leather, and articles of textiles or leather	510,486	3.5	39,813	0.3	24,337	0.8	1,083
31	Nonmetallic mineral products	203,609	1.4	920,764	7.4	103,609	3.3	544
32	Base metal in primary or semifinished forms and in finished basic shapes	464,454	3.2	332,177	2.7	113,627	3.6	413
33	Articles of base metal	394,331	2.7	128,364	1.0	49,046	1.6	559
34	Machinery	870,494	6.0	94,760	0.8	42,825	1.4	439
35	Electronic and other electrical equipment and components and office equipment	1,135,570	7.8	56,855	0.5	31,133	1.0	783
36	Motorized and other vehicles (including parts)	1,244,898	8.6	170,451	1.4	66,873	2.1	475
37	Transportation equipment, n.e.c.	281,929	1.9	6,515	0.1	3,804	0.1	918
38	Precision instruments and apparatus	384,066	2.6	7,753	0.1	5,493	0.2	910
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	179,022	1.2	26,989	0.2	14,982	0.5	822
40	Miscellaneous manufactured products	607,982	4.2	81,807	0.7	35,133	1.1	1,063
41	Waste and scrap	71,137	0.5	235,833	1.9	52,155	1.7	157
43	Mixed freight	1,447,781	10.0	406,212	3.3	79,815	2.6	383
99	Commodity unknown	X	X	X	X	X	X	X

X Not applicable.

Z Rounds to zero.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[2] Estimates exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table A5b.

Shipment Characteristics by Two-Digit Commodity for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value			Tons			Ton-miles[1]			Average miles per shipment		
		2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
	All commodities[2]	**14,517,812**	**13,852,143**	**4.8**	**12,468,902**	**11,299,409**	**10.4**	**3,116,876**	**2,969,506**	**5.0**	**679**	**630**	**7.9**
01	Live animals and live fish	10,777	6,390	68.6	4,573	2,237	104.4	1,570	1,475	6.4	866	565	53.3
02	Cereal grains (includes seed)	108,561	130,140	–16.6	707,113	479,064	47.6	230,498	184,888	24.7	158	202	–21.9
03	Agricultural products (excludes animal feed, cereal grains, and forage products)	236,965	197,793	19.8	315,168	218,995	43.9	145,852	107,383	35.8	524	505	3.9
04	Animal feed, eggs, honey, and other products of animal origin	134,423	118,666	13.3	325,312	238,507	36.4	78,947	59,660	32.3	514	706	–27.3
05	Meat, poultry, fish, seafood, and their preparations	356,421	302,153	18.0	93,872	90,090	4.2	46,001	43,798	5.0	183	184	–0.7
06	Milled grain products and preparations and bakery products	198,051	151,799	30.5	132,818	115,109	15.4	56,404	53,947	4.6	187	169	10.6
07	Other prepared foodstuffs and fats and oils	606,280	584,496	3.7	530,168	527,393	0.5	203,307	201,438	0.9	373	450	–17.1
08	Alcoholic beverages, and denatured alcohol	226,894	178,011	27.5	111,861	99,255	12.7	27,798	35,176	–21.0	195	81	140.5
09	Tobacco products	79,806	67,395	18.4	4,659	2,919	59.6	877	650	34.8	1,014	830	22.1
10	Monumental or building stone	7,193	4,221	70.4	14,072	11,366	23.8	2,474	1,605	54.1	345	135	156.5
11	Natural sands	12,211	7,806	56.4	535,935	438,136	22.3	112,790	38,847	190.3	170	51	231.3
12	Gravel and crushed stone (excludes dolomite and slate)	19,664	17,519	12.2	1,615,187	1,538,494	5.0	95,990	82,244	16.7	41	30	36.5
13	Other nonmetallic minerals, n.e.c.	24,581	13,646	80.1	216,583	144,500	49.9	57,099	35,384	61.4	274	253	8.4
14	Metallic ores and concentrates	30,734	29,072	5.7	70,510	94,801	–25.6	44,267	48,181	–8.1	607	397	52.7
15	Coal	31,673	41,178	–23.1	878,235	1,047,934	–16.2	483,112	663,676	–27.2	74	87	–15.6
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	745,954	1,158,935	–35.6	1,388,364	1,244,059	11.6	138,279	97,395	42.0	44	46	–3.3
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	474,617	706,535	–32.8	909,140	843,282	7.8	79,304	59,341	33.6	36	31	17.0
19	Other coal and petroleum products, n.e.c.	258,447	388,085	–33.4	547,120	528,059	3.6	88,371	99,564	–11.2	65	98	–34.5
20	Basic chemicals	290,944	316,754	–8.1	418,746	342,969	22.1	151,553	143,230	5.8	421	662	–36.4
21	Pharmaceutical products	1,099,027	814,703	34.9	19,569	16,197	20.8	10,129	7,798	29.9	623	656	–5.0
22	Fertilizers	57,886	84,213	–31.3	172,509	193,918	–11.0	40,112	61,745	–35.0	102	142	–28.1
23	Chemical products and preparations, n.e.c.	431,214	351,146	22.8	127,478	105,660	20.6	60,718	46,991	29.2	881	667	32.0
24	Plastics and rubber	642,524	549,130	17.0	224,812	182,918	22.9	123,629	100,600	22.9	689	696	–1.0
25	Logs and other wood in the rough	6,508	4,527	43.8	25,637	35,123	–27.0	5,411	3,878	39.5	138	184	–25.3
26	Wood products	220,916	144,134	53.3	322,769	297,429	8.5	88,755	82,275	7.9	350	299	17.0
27	Pulp, newsprint, paper, and paperboard	127,501	123,892	2.9	139,603	123,300	13.2	83,375	69,122	20.6	267	261	2.1
28	Paper or paperboard articles	148,420	126,268	17.5	80,854	76,530	5.7	26,305	26,687	–1.4	577	634	–9.0
29	Printed products	133,862	159,583	–16.1	27,940	38,800	–28.0	11,119	14,890	–25.3	480	506	–5.1
30	Textiles, leather, and articles of textiles or leather	510,486	465,777	9.6	39,813	39,849	–0.1	24,337	25,485	–4.5	1,083	1,064	1.8
31	Nonmetallic mineral products	203,609	180,504	12.8	920,764	793,046	16.1	103,609	93,581	10.7	544	414	31.2
32	Base metal in primary or semifinished forms and in finished basic shapes	464,454	457,280	1.6	332,177	304,658	9.0	113,627	109,923	3.4	413	320	29.1
33	Articles of base metal	394,331	352,135	12.0	128,364	100,754	27.4	49,046	41,985	16.8	559	530	5.6
34	Machinery	870,494	753,095	15.6	94,760	74,650	26.9	42,825	36,968	15.8	439	438	0.2
35	Electronic and other electrical equipment and components and office equipment	1,135,570	1,031,944	10.0	56,855	46,212	23.0	31,133	28,362	9.8	783	838	–6.6
36	Motorized and other vehicles (including parts)	1,244,898	1,038,341	19.9	170,451	130,069	31.0	66,873	64,758	3.3	475	479	–0.9
37	Transportation equipment, n.e.c.	281,929	280,391	0.5	6,515	7,514	–13.3	3,804	4,342	–12.4	918	844	8.8
38	Precision instruments and apparatus	384,066	351,894	9.1	7,753	7,306	6.1	5,493	5,324	3.2	910	954	–4.6
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	179,022	160,790	11.3	26,989	27,573	–2.1	14,982	13,621	10.0	822	837	–1.8
40	Miscellaneous manufactured products	607,982	517,067	17.6	81,807	74,128	10.4	35,133	31,204	12.6	1,063	1,042	2.1
41	Waste and scrap	71,137	107,002	–33.5	235,833	241,232	–2.2	52,155	66,654	–21.8	157	183	–14.6
43	Mixed freight	1,447,781	1,377,371	5.1	406,212	374,071	8.6	79,815	75,269	6.0	383	413	–7.1
99	Commodity unkown	X	360	X	X	1,303	X	X	162	X	X	112	X

X Not applicable.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[2] Estimates exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table A6.

Shipment Characteristics by Three-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value		Tons		Ton-miles[1]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
	All commodities[2]	**14,517,812**	**100.0**	**12,468,902**	**100.0**	**3,116,876**	**100.0**	**679**
010	Live animals and live fish	10,777	0.1	4,573	Z	1,570	0.1	866
021	Wheat	25,932	0.2	148,319	1.2	56,317	1.8	399
022	Corn, except sweet	67,397	0.5	503,958	4.0	159,467	5.1	84
029	Other cereal grains	15,232	0.1	54,836	0.4	14,714	0.5	172
031	Fresh or chilled potatoes, except sweet	9,526	0.1	8,174	0.1	4,902	0.2	194
032	Fresh or chilled edible vegetables (except potatoes), and dried vegetables	63,871	0.4	76,617	0.6	40,098	1.3	122
033	Fruit and nuts, edible, fresh, chilled, or dried	60,220	0.4	33,390	0.3	16,402	0.5	536
034	Soy beans	52,171	0.4	159,560	1.3	69,338	2.2	108
035	Oil seeds and nuts, except olives and soy beans	6,421	Z	9,153	0.1	2,698	0.1	851
036	Bulbs, live plants, and seeds for sowing, n.e.c.	19,229	0.1	10,433	0.1	5,307	0.2	1,099
039	Fresh-cut flowers, plants, and parts of plants, and other agricultural products	25,526	0.2	17,840	0.1	7,106	0.2	631
041	Eggs, cereal straw or husks, forage products, residues and waste from the food industries used in animal feeding, other products of animal origin, n.e.c.	41,925	0.3	143,862	1.2	48,552	1.6	140
042	Animal feed preparations	92,498	0.6	181,450	1.5	30,395	1.0	770
051	Meat and poultry, fresh, chilled, or frozen, meat in brine, dried or smoked	291,170	2.0	84,674	0.7	40,562	1.3	209
052	Fish (except live), seafood, and their preparations	61,899	0.4	8,203	0.1	4,875	0.2	144
053	Preparations, extracts, and juices of meat, fish, or seafood	3,352	Z	995	Z	563	Z	376
061	Wheat flour, groats, and meal	13,146	0.1	25,560	0.2	7,097	0.2	121
062	Malt, milled rice and corn (broken, flour, groats, and meal, inulin, wheat gluten, milled cereals and other vegetables and grains)	19,768	0.1	46,057	0.4	24,287	0.8	259
063	Bakery products and food preparations of cereals, flour, starch or milk	50,493	0.3	22,996	0.2	11,257	0.4	269
064	Bakery products, including frozen	114,642	0.8	38,205	0.3	13,763	0.4	164
071	Dairy products except beverages and preparations of milk	154,678	1.1	80,101	0.6	27,713	0.9	114
072	Processed or prepared vegetables, fruit, or nuts, except dried or milled, and juices	74,548	0.5	47,798	0.4	32,340	1.0	289
073	Coffee, tea, and spices, except unprocessed coffee and unfermented tea	37,118	0.3	8,779	0.1	4,458	0.1	658
074	Animal or vegetable fats, oils, waxes, and their cleavage products, prepared edible fats, and flours and meals of oil seeds (excludes oils and fats for use as biodiesel)	53,357	0.4	81,336	0.7	45,178	1.4	481
075	Sugars confectionery, solid or syrups not containing added flavoring or coloring	21,538	0.1	42,221	0.3	23,248	0.7	262
076	Confectionery, cocoa, and cocoa preparations	36,289	0.2	8,794	0.1	5,263	0.2	867
077	Edible preparations, n.e.c., and vinegar	85,664	0.6	40,960	0.3	27,074	0.9	765
078	Nonalcoholic beverages, n.e.c., and ice	143,087	1.0	220,180	1.8	38,034	1.2	139
081	Malt beer	113,654	0.8	84,546	0.7	14,637	0.5	33
082	Wine and other fermented beverages	62,031	0.4	15,022	0.1	6,976	0.2	440
083	Spirituous beverages and undenatured ethyl alcohol	48,884	0.3	10,001	0.1	4,886	0.2	183
084	Denatured ethyl alcohol, not for ingestion or use as biofuel	2,325	Z	2,293	Z	1,299	Z	576
090	Tobacco products	79,806	0.5	4,659	Z	877	Z	1,014
100	Monumental or building stone, except dolomite	7,193	Z	14,072	0.1	2,474	0.1	345
110	Natural sands, except metal-bearing	12,211	0.1	535,935	4.3	112,790	3.6	170
120	Gravel and crushed stone, except dolomite and slate	19,664	0.1	1,615,187	13.0	95,990	3.1	41
131	Salt	7,180	Z	51,798	0.4	21,259	0.7	196
132	Natural calcium phosphates, natural aluminum-calcium phosphates, and phosphatic chalk	1,084	Z	12,347	0.1	938	Z	326
133	Dolomite, including monumental, building, and crushed	815	Z	64,612	0.5	4,251	0.1	34
139	Other nonmetallic minerals, n.e.c.	15,503	0.1	87,826	0.7	30,651	1.0	376
141	Iron ores and concentrates	4,603	Z	61,486	0.5	40,406	1.3	S
149	Metallic ores and concentrates, except iron	26,131	0.2	9,024	0.1	3,861	0.1	638
151	Nonagglomerated bituminous coal	28,558	0.2	774,394	6.2	481,771	15.5	83
159	Coal, except nonagglomerated bituminous coal	3,115	Z	103,842	0.8	1,341	Z	S
171	Gasoline, and blends of gasoline and 10 percent ethanol	662,438	4.6	1,211,030	9.7	86,876	2.8	42
172	Aviation turbine fuel (types a and b), and kerosene	49,549	0.3	105,406	0.8	10,213	0.3	41
175	Ethanol, ethanol blends of more than 10 percent ethanol, and other fuel alcohols	9,521	0.1	19,816	0.2	6,551	0.2	S
176	Ethanol, for use as biofuels	24,446	0.2	52,113	0.4	34,638	1.1	234
181	Fuel oils	375,630	2.6	724,536	5.8	64,436	2.1	37
182	Blends of fuel oils and biofuel, biodiesel	98,987	0.7	184,605	1.5	14,869	0.5	34
191	Lubricating oils and greases	116,736	0.8	68,575	0.5	20,046	0.6	137

See footnotes at end of table.

Table A6.

Shipment Characteristics by Three-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value		Tons		Ton-miles[1]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
192	Refined petroleum oils and oils obtained from bituminous minerals, n.e.c.	24,733	0.2	63,468	0.5	14,926	0.5	118
193	Gaseous hydrocarbons	66,375	0.5	103,414	0.8	9,879	0.3	25
199	Other products of petroleum refining, and coal products, n.e.c.	50,603	0.3	311,663	2.5	43,519	1.4	81
201	Sodium hydroxide (caustic soda) and potassium hydroxide (caustic potash)	11,245	0.1	36,728	0.3	13,641	0.4	243
202	Inorganic chemicals, n.e.c.	102,620	0.7	249,565	2.0	74,074	2.4	180
203	Cyclic hydrocarbons	26,292	0.2	32,165	0.3	10,873	0.3	291
204	Phenols, phenol-alcohols, aldehydes, cyclic polymers of aldehydes, and acyclic alcohols, and organic acids	30,712	0.2	28,873	0.2	15,331	0.5	560
205	Organic chemicals, n.e.c.	120,074	0.8	71,416	0.6	37,633	1.2	611
210	Pharmaceutical products	1,099,027	7.6	19,569	0.2	10,129	0.3	623
220	Fertilizers and fertilizer materials	57,886	0.4	172,509	1.4	40,112	1.3	102
231	Paints and varnishes, enamels, tanning or dyeing extracts, tannins and their derivatives, inks, lakes, toners, and ink	61,366	0.4	16,255	0.1	8,148	0.3	431
232	Essential oils and resinoids, and perfumery, cosmetic, or toilet preparations	132,533	0.9	13,651	0.1	9,275	0.3	1,001
233	Soap, organic surface-active agents, cleaning preparations, polishes and creams, and scouring preps	62,531	0.4	35,608	0.3	18,083	0.6	635
234	Photographic film, plates, paper, paperboard, or textiles, and chemical preps for photographic use	11,579	0.1	2,358	Z	1,209	Z	552
235	Insecticides, rodenticides, fungicides, herbicides, disinfectants, etc.	55,426	0.4	13,131	0.1	4,002	0.1	343
239	Other chemical products and preparations: glues, prepared explosives, activated natural mineral products, anti-knock preparations, etc.	107,779	0.7	46,475	0.4	20,002	0.6	474
241	Plastics and rubber in primary forms or sheets	150,218	1.0	103,657	0.8	66,488	2.1	597
242	Manmade fibers and plastics basic shapes and articles	342,188	2.4	93,496	0.7	43,892	1.4	948
243	Rubber articles	150,117	1.0	27,659	0.2	13,249	0.4	264
250	Logs and other wood in the rough	6,508	Z	25,637	0.2	5,411	0.2	138
261	Wood chips or particles	4,034	Z	69,578	0.6	9,307	0.3	154
262	Lumber, wood continuously shaped along any of its edges or faces, shingles and shakes	98,396	0.7	147,474	1.2	48,119	1.5	273
263	Veneer sheets and sheets for plywood, particle board, fiberboard, plywood, and similar laminatedwood	44,983	0.3	52,648	0.4	21,469	0.7	225
264	Windows, doors, thresholds, and builders' joinery and carpentry of wood, except shingles andshakes	45,309	0.3	18,953	0.2	3,870	0.1	375
269	Other wood products	28,194	0.2	34,116	0.3	5,989	0.2	584
271	Pulp of fibrous cellulosic materials	7,117	Z	9,740	0.1	4,995	0.2	386
272	Newsprint in large rolls or sheets	1,666	Z	2,625	Z	1,434	Z	338
273	Uncoated paper, tissue, and paperboard in large rolls or sheets	74,317	0.5	85,043	0.7	45,741	1.5	211
274	Coated, impregnated, treated, or worked paper and paperboard, in large rolls or sheets	44,401	0.3	42,195	0.3	31,205	1.0	456
280	Paper or paperboard articles	148,420	1.0	80,854	0.6	26,305	0.8	577
291	Printed books, brochures, leaflets, and similar printed products	55,009	0.4	9,150	0.1	3,833	0.1	898
292	Newspapers, journals, and periodicals	17,631	0.1	7,329	0.1	1,022	Z	44
293	Advertising material, commercial or trade catalogues, and similar printed products	19,069	0.1	5,685	Z	3,267	0.1	676
299	Other printed products	42,154	0.3	5,777	Z	2,996	0.1	832
301	Textile fibers, yarns, and broad woven or knitted fabrics	60,129	0.4	7,068	0.1	3,328	0.1	1,203
302	Textile clothing and accessories, and headgear, except safety	259,179	1.8	12,293	0.1	8,150	0.3	1,084
303	Textiles and textile articles, n.e.c.	107,679	0.7	16,274	0.1	9,744	0.3	1,046
304	Leather footwear	46,505	0.3	1,657	Z	1,549	Z	1,066
305	Leather and articles of leather or allied materials, and dressed fur skins	36,994	0.3	2,521	Z	1,566	0.1	1,052
311	Hydraulic cements	10,575	0.1	113,265	0.9	11,893	0.4	69
312	Ceramic products	27,212	0.2	17,908	0.1	6,742	0.2	752
313	Glass and glass products	56,684	0.4	37,196	0.3	14,567	0.5	893
319	Other nonmetallic mineral products	109,137	0.8	752,395	6.0	70,407	2.3	118
321	Ferro-alloys, and iron and steel in primary or semi-finished forms, or in powders or granules	45,698	0.3	38,265	0.3	13,247	0.4	650
322	Flat-rolled products of iron or steel	162,358	1.1	168,368	1.4	50,837	1.6	264
323	Bars, rods, angles, shapes, sections, and wire, of iron or steel	90,620	0.6	76,553	0.6	25,059	0.8	275
324	Nonferrous metal, except precious, unwrought, or in finished basic shapes, or in powders orgranules	165,778	1.1	48,992	0.4	24,483	0.8	532
331	Pipes, tubes, and fittings	116,175	0.8	56,501	0.5	20,924	0.7	249
332	Structures and parts, except prefabricated buildings	72,640	0.5	22,806	0.2	8,713	0.3	330
333	Hand tools, cutlery, except of precious metals, interchangeable tools for hand or machine tools, hardware, and industrial fasteners	97,600	0.7	14,266	0.1	5,767	0.2	656

See footnotes at end of table.

Table A6.

Shipment Characteristics by Three-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value		Tons		Ton-miles[1]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
339	Other articles of metal	107,916	0.7	34,791	0.3	13,641	0.4	713
341	Internal-combustion engines and parts	133,350	0.9	13,566	0.1	6,493	0.2	366
342	Turbines, boilers, nuclear reactors, and nonelectric engines and motors, except internal-combustion	58,895	0.4	1,364	Z	797	Z	448
343	Pumps, compressors, fans, and ventilating or recycling hoods incorporating a fan	82,769	0.6	7,722	0.1	6,166	0.2	578
344	Air-conditioning, refrigerating, or freezing equipment	88,511	0.6	11,924	0.1	4,390	0.1	340
345	Materials-handling, excavating, boring, and related machinery and equipment	145,132	1.0	28,889	0.2	8,606	0.3	308
349	Other mechanical machinery, n.e.c.	361,837	2.5	31,295	0.3	16,373	0.5	487
351	Electric motors, generators, rotary or static converters, and transformers	68,816	0.5	5,286	Z	3,675	0.1	1,032
352	Electric cooking appliances, electro-thermic, or electro-mechanical domestic appliances	38,570	0.3	4,229	Z	2,794	0.1	866
353	Line telephone or telegraph apparatus	28,230	0.2	529	Z	328	Z	1,046
354	Electronic entertainment products, except parts	73,762	0.5	3,429	Z	2,702	0.1	885
355	Computer and electronic office equipment	206,676	1.4	3,837	Z	2,550	0.1	1,126
356	Prepared unrecorded or prerecorded media	20,650	0.1	846	Z	355	Z	342
357	Transmission, and reception apparatus for radio, television, radar, and remote-control	64,840	0.4	782	Z	621	Z	1,113
358	Electronic components and parts	185,310	1.3	3,203	Z	2,378	0.1	872
359	Other electronic and electrical equipment, n.e.c.	448,717	3.1	34,714	0.3	15,730	0.5	739
361	Motorized vehicles for transport of less than 10 people, except motorcycles, armored, and recreational	347,596	2.4	28,084	0.2	16,288	0.5	527
362	Motor vehicles for the transport of goods, and road tractors for semi-trailers	68,205	0.5	9,032	0.1	5,492	0.2	189
363	Other vehicles	210,578	1.5	35,586	0.3	12,072	0.4	680
364	Motor vehicles parts and accessories except motorcycles and armored fighting vehicles	618,518	4.3	97,749	0.8	33,020	1.1	456
371	Railway equipment including locomotives and rolling stock, railway track fixtures and fittings, andparts	11,802	0.1	4,381	Z	2,121	0.1	594
372	Aircraft and spacecraft	243,358	1.7	1,309	Z	1,285	Z	954
373	Ships, boats, and floating structures	26,768	0.2	825	Z	397	Z	860
381	Optical elements, instruments, and apparatus, except photographic and cinematographic	37,300	0.3	370	Z	285	Z	861
382	Photographic and photocopying machines	23,327	0.2	1,121	Z	S	S	525
383	Surveying, hydrographic, oceanographic, hydrological, meteorological, and geophysical instruments and appliances	8,818	0.1	44	Z	51	Z	1,050
384	Instruments, apparatus, and appliances for medical, surgical, dental, veterinary, or similar purposes	231,327	1.6	4,457	Z	3,064	0.1	965
385	Meters and other instruments and apparatus for measuring or process control	83,294	0.6	1,761	Z	1,216	Z	903
390	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	179,022	1.2	26,989	0.2	14,982	0.5	822
401	Arms and ammunition	23,785	0.2	648	Z	533	Z	1,042
402	Toys, games, and sporting equipment	102,823	0.7	6,490	0.1	5,755	0.2	1,178
409	Miscellaneous manufactured products	481,374	3.3	74,669	0.6	28,844	0.9	1,024
411	Metallic waste and scrap	57,656	0.4	165,103	1.3	36,797	1.2	151
412	Nonmetallic waste and scrap, except from food processing	13,481	0.1	70,730	0.6	15,358	0.5	169
439	Mixed freight	1,447,781	10.0	406,212	3.3	79,815	2.6	383
999	Commodity unknown	X	X	X	X	X	X	X

S Withheld because estimate did not meet publication standards.
X Not applicable.
Z Rounds to zero.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[2] Estimates exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table A7a.

Shipment Characteristics by NAICS[1] for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

NAICS code	NAICS description	Value (million dollars)	Tons (thousands)	Ton-miles[2] (millions)	Average miles per shipment
	Total	**14,517,812**	**12,468,902**	**3,116,876**	**679**
212	Mining (except oil and gas)	92,648	2,897,512	768,042	69
31–33	Manufacturing	5,702,543	4,707,859	1,414,969	715
311	Food manufacturing	797,465	626,153	301,930	288
312	Beverage and tobacco product manufacturing	160,044	156,859	48,220	367
313	Textile mills	29,575	6,415	3,805	727
314	Textile product mills	25,695	5,251	2,540	922
315	Apparel manufacturing	14,043	475	391	1,071
316	Leather and allied product manufacturing	5,040	674	758	1,181
321	Wood product manufacturing	111,812	225,505	72,711	433
322	Paper manufacturing	191,972	163,164	85,442	530
323	Printing and related support activities	85,771	20,273	9,099	749
324	Petroleum and coal products manufacturing	552,392	1,377,825	199,813	169
325	Chemical manufacturing	745,166	714,419	337,238	835
326	Plastics and rubber products manufacturing	241,059	65,814	36,626	735
327	Nonmetallic mineral product manufacturing	129,607	855,925	86,424	220
331	Primary metal manufacturing	227,183	175,072	78,833	614
332	Fabricated metal product manufacturing	354,349	113,998	43,480	623
333	Machinery manufacturing	375,493	42,290	28,022	841
334	Computer and electronic product manufacturing	321,741	5,365	4,803	1,256
335	Electrical equipment, appliance, and component manufacturing	129,471	16,409	11,671	1,051
336	Transportation equipment manufacturing	961,036	113,202	47,446	719
337	Furniture and related product manufacturing	77,209	15,174	9,525	722
339	Miscellaneous manufacturing	166,420	7,597	6,191	1,000
42	Wholesale trade	6,793,885	4,435,153	842,866	419
423	Merchant wholesalers, durable goods	3,115,203	1,083,674	246,964	468
4231	Motor vehicle and motor vehicle parts and supplies merchant wholesalers	671,374	90,319	31,444	321
4232	Furniture and home furnishing merchant wholesalers	96,286	24,930	10,476	699
4233	Lumber and other construction materials merchant wholesalers	173,229	345,473	31,048	125
4234	Professional and commercial equipment and supplies merchant wholesalers	520,414	27,497	12,733	704
4235	Metal and mineral (except petroleum) merchant wholesalers	199,668	147,377	33,707	214
4236	Electrical and electronic goods merchant wholesalers	550,194	38,176	15,732	583
4237	Hardware, plumbing and heating equipment and supplies merchant wholesalers	171,644	26,530	7,355	275
4238	Machinery, equipment, and supplies merchant wholesalers	500,368	92,647	23,841	320
4239	Miscellaneous durable goods merchant wholesalers	232,027	290,723	80,631	875
424	Merchant wholesalers, nondurable goods	3,678,682	3,351,479	595,901	334
4241	Paper and paper product merchant wholesalers	130,932	48,021	12,185	289
4242	Drugs and druggists' sundries merchant wholesalers	787,231	21,343	8,664	433
4243	Apparel, piece goods, and notions merchant wholesalers	146,976	10,341	6,356	992
4244	Grocery and related product merchant wholesalers	862,824	399,734	79,981	150
4245	Farm product raw material merchant wholesalers	222,586	924,225	320,921	84
4246	Chemical and allied products merchant wholesalers	200,004	194,337	41,322	239
4247	Petroleum and petroleum products merchant wholesalers	853,663	1,439,449	79,827	50
4248	Beer, wine, and distilled alcoholic beverage merchant wholesalers	163,061	67,403	5,027	65
4249	Miscellaneous nondurable goods merchant wholesalers	311,404	246,626	41,618	574
4541	Electronic shopping and mail-order houses	540,509	24,336	18,749	1,149
45431	Fuel dealers	33,824	53,732	1,143	21
4931[3]	Warehousing and storage	1,182,016	274,944	56,617	687
5111	Newspaper, periodical, book, and directory publishers	23,874	4,055	695	92
551114	Corporate, subsidiary, and regional managing offices	148,512	71,310	13,793	904

[1] NAICS codes shown are those covered in the Commodity Flow Survey.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] For tabulation and publication purposes, NAICS 484 is grouped with NAICS 4931.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table A7b.

Shipment Characteristics by NAICS[1] for the United States: 2017 and 2012—Con.

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

NAICS code	NAICS description	Value			Tons			Ton-miles[2]			Average miles per shipment		
		2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
	Total	**14,517,812**	**13,852,143**	**4.8**	**12,468,902**	**11,299,409**	**10.4**	**3,116,876**	**2,969,506**	**5.0**	**679**	**630**	**7.9**
212	Mining (except oil and gas)	92,648	99,888	-7.2	2,897,512	2,900,863	-0.1	768,042	859,267	-10.6	69	47	46.0
31-33	Manufacturing	5,702,543	5,679,313	0.4	4,707,859	4,155,850	13.3	1,414,969	1,279,523	10.6	715	713	0.4
311	Food manufacturing	797,465	744,573	7.1	626,153	545,892	14.7	301,930	261,169	15.6	288	239	20.4
312	Beverage and tobacco product manufacturing	160,044	142,936	12.0	156,859	159,843	-1.9	48,220	49,408	-2.4	367	292	25.7
313	Textile mills	29,575	30,328	-2.5	6,415	7,101	-9.7	3,805	3,731	2.0	727	765	-5.0
314	Textile product mills	25,695	21,595	19.0	5,251	5,096	3.0	2,540	2,313	9.8	922	918	0.4
315	Apparel manufacturing	14,043	12,462	12.7	475	515	-7.7	391	402	-2.8	1,071	1,169	-8.4
316	Leather and allied product manufacturing	5,040	4,870	3.5	674	688	-1.9	758	707	7.1	1,181	1,105	6.9
321	Wood product manufacturing	111,812	76,802	45.6	225,505	211,440	6.7	72,711	59,705	21.8	433	341	26.8
322	Paper manufacturing	191,972	180,585	6.3	163,164	156,327	4.4	85,442	83,270	2.6	530	532	-0.4
323	Printing and related support activities	85,771	79,263	8.2	20,273	21,535	-5.9	9,099	10,296	-11.6	749	769	-2.6
324	Petroleum and coal products manufacturing	552,392	835,321	-33.9	1,377,825	1,222,084	12.7	199,813	165,106	21.0	169	216	-21.6
325	Chemical manufacturing	745,166	785,839	-5.2	714,419	609,778	17.2	337,238	313,078	7.7	835	887	-5.8
326	Plastics and rubber products manufacturing	241,059	216,973	11.1	65,814	59,798	10.1	36,626	33,421	9.6	735	764	-3.8
327	Nonmetallic mineral product manufacturing	129,607	98,603	31.4	855,925	707,054	21.1	86,424	73,594	17.4	220	180	22.1
331	Primary metal manufacturing	227,183	265,380	-14.4	175,072	189,419	-7.6	78,833	87,875	-10.3	614	602	2.0
332	Fabricated metal product manufacturing	354,349	333,287	6.3	113,998	96,723	17.9	43,480	38,545	12.8	623	562	10.9
333	Machinery manufacturing	375,493	402,610	-6.7	42,290	36,938	14.5	28,022	26,510	5.7	841	889	-5.4
334	Computer and electronic product manufacturing	321,741	331,636	-3.0	5,365	4,576	17.2	4,803	3,791	26.7	1,256	1,164	7.9
335	Electrical equipment, appliance, and component manufacturing	129,471	120,145	7.8	16,409	16,619	-1.3	11,671	12,347	-5.5	1,051	998	5.3
336	Transportation equipment manufacturing	961,036	782,011	22.9	113,202	80,977	39.8	47,446	38,028	24.8	719	806	-10.8
337	Furniture and related product manufacturing	77,209	66,809	15.6	15,174	14,850	2.2	9,525	9,652	-1.3	722	792	-8.8
339	Miscellaneous manufacturing	166,420	147,284	13.0	7,597	8,599	-11.6	6,191	6,571	-5.8	1,000	1,003	-0.4
42	Wholesale trade	6,793,885	6,119,269	11.0	4,435,153	3,780,403	17.3	842,866	723,220	16.5	419	413	1.5
423	Merchant wholesalers, durable goods	3,115,203	2,605,062	19.6	1,083,674	969,034	11.8	246,964	228,502	8.1	468	455	2.9
4231	Motor vehicle and motor vehicle parts and supplies merchant wholesalers	671,374	540,855	24.1	90,319	66,571	35.7	31,444	31,340	0.3	321	381	-15.8
4232	Furniture and home furnishing merchant wholesalers	96,286	66,139	45.6	24,930	16,524	50.9	10,476	9,024	16.1	699	672	4.0
4233	Lumber and other construction materials merchant wholesalers	173,229	114,200	51.7	345,473	329,887	4.7	31,048	31,865	-2.6	125	87	44.1
4234	Professional and commercial equipment and supplies merchant wholesalers	520,414	437,435	19.0	27,497	22,255	23.6	12,733	12,219	4.2	704	642	9.6
4235	Metal and mineral (except petroleum) merchant wholesalers	199,668	202,708	-1.5	147,377	151,632	-2.8	33,707	49,683	-32.2	214	223	-3.9
4236	Electrical and electronic goods merchant wholesalers	550,194	450,951	22.0	38,176	26,276	45.3	15,732	12,083	30.2	583	517	12.7
4237	Hardware, plumbing and heating equipment and supplies merchant wholesalers	171,644	125,401	36.9	26,530	18,443	43.9	7,355	5,011	46.8	275	257	7.1
4238	Machinery, equipment, and supplies merchant wholesalers	500,368	433,454	15.4	92,647	64,434	43.8	23,841	14,655	62.7	320	323	-0.8
4239	Miscellaneous durable goods merchant wholesalers	232,027	233,919	-0.8	290,723	273,012	6.5	80,631	62,620	28.8	875	829	5.6
424	Merchant wholesalers, nondurable goods	3,678,682	3,514,207	4.7	3,351,479	2,811,368	19.2	595,901	494,718	20.5	334	321	4.1
4241	Paper and paper product merchant wholesalers	130,932	96,163	36.2	48,021	39,288	22.2	12,185	7,602	60.3	289	314	-8.1
4242	Drugs and druggists' sundries merchant wholesalers	787,231	535,889	46.9	21,343	12,815	66.5	8,664	6,710	29.1	433	487	-11.1
4243	Apparel, piece goods, and notions merchant wholesalers	146,976	121,916	20.6	10,341	9,535	8.5	6,356	8,015	-20.7	992	997	-0.5
4244	Grocery and related product merchant wholesalers	862,824	647,284	33.3	399,734	336,965	18.6	79,981	66,571	20.1	150	123	21.5
4245	Farm product raw material merchant wholesalers	222,586	239,194	-6.9	924,225	642,820	43.8	320,921	260,458	23.2	84	265	-68.3

See footnotes at end of table.

Table A7b.

Shipment Characteristics by NAICS[1] for the United States: 2017 and 2012—Con.

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

NAICS code	NAICS description	Value			Tons			Ton-miles[2]			Average miles per shipment		
		2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
4246	Chemical and allied products merchant wholesalers	200,004	153,656	30.2	194,337	104,935	85.2	41,322	22,535	83.4	239	223	7.3
4247	Petroleum and petroleum products merchant wholesalers	853,663	1,319,585	-35.3	1,439,449	1,396,357	3.1	79,827	77,968	2.4	50	74	-31.9
4248	Beer, wine, and distilled alcoholic beverage merchant wholesalers	163,061	120,471	35.4	67,403	55,359	21.8	5,027	2,973	69.1	65	43	51.9
4249	Miscellaneous nondurable goods merchant wholesalers	311,404	280,049	11.2	246,626	213,293	15.6	41,618	41,886	-0.6	574	445	28.9
4541	Electronic shopping and mail-order houses	540,509	318,266	69.8	24,336	11,966	103.4	18,749	9,392	99.6	1,149	1,173	-2.0
45431	Fuel dealers	33,824	35,694	-5.2	53,732	36,034	49.1	1,143	734	55.7	21	19	13.5
4931[3]	Warehousing and storage	1,182,016	1,207,896	-2.1	274,944	294,522	-6.6	56,617	60,458	-6.4	687	748	-8.2
5111	Newspaper, periodical, book, and directory publishers	23,874	49,500	-51.8	4,055	11,660	-65.2	695	2,130	-67.4	92	S	S
551114	Corporate, subsidiary, and regional managing offices	148,512	342,317	-56.6	71,310	108,111	-34.0	13,793	34,782	-60.3	904	769	17.5

S Withheld because estimate did not meet publication standards.

[1] NAICS codes shown are those covered in the Commodity Flow Survey.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] For tabulation and publication purposes, NAICS 484 is grouped with NAICS 4931.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table A8.

Shipment Characteristics by Origin State: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Origin state	Value (million dollars)	Tons (thousands)	Ton-miles[1] (millions)	Average miles per shipment
Total	**14,517,812**	**12,468,902**	**3,116,876**	**679**
Alabama	235,467	202,724	54,399	485
Alaska	19,171	21,512	4,266	1,021
Arizona	180,489	114,473	20,626	996
Arkansas	116,384	142,063	32,044	400
California	1,666,672	779,935	193,193	1,090
Colorado	173,655	152,040	48,345	548
Connecticut	189,712	89,278	9,861	509
Delaware	55,781	29,456	5,041	380
District of Columbia	2,296	2,731	105	S
Florida	525,179	452,773	62,542	488
Georgia	476,321	276,623	68,634	501
Hawaii	23,139	27,615	908	677
Idaho	50,642	58,912	23,237	564
Illinois	803,696	674,575	188,827	488
Indiana	438,158	416,175	97,322	686
Iowa	212,449	325,795	90,961	466
Kansas	189,529	220,836	42,489	359
Kentucky	251,495	249,178	76,848	654
Louisiana	280,857	507,846	141,606	270
Maine	38,040	39,152	8,021	539
Maryland	156,408	118,429	14,756	343
Massachusetts	272,093	134,415	19,976	747
Michigan	547,720	361,459	63,996	448
Minnesota	302,418	376,383	159,490	618
Mississippi	141,191	99,111	30,814	508
Missouri	282,849	245,309	71,149	667
Montana	26,708	82,093	54,246	424
Nebraska	109,637	186,987	50,923	527
Nevada	60,657	40,647	10,638	822
New Hampshire	50,783	35,843	3,753	894
New Jersey	464,667	205,201	31,720	493
New Mexico	33,943	57,687	12,575	327
New York	590,502	321,123	45,414	611
North Carolina	439,152	235,893	46,940	645
North Dakota	44,881	126,504	41,669	437
Ohio	609,258	499,632	93,129	604
Oklahoma	133,794	174,326	36,860	303
Oregon	152,627	127,991	33,355	985
Pennsylvania	631,829	429,538	79,986	603
Rhode Island	46,091	19,847	2,183	821
South Carolina	211,596	127,312	32,147	492
South Dakota	37,278	79,792	35,601	418
Tennessee	405,479	256,508	57,986	784
Texas	1,635,873	1,860,241	318,055	375
Utah	130,801	109,253	30,106	1,169
Vermont	24,365	16,118	5,652	538
Virginia	262,074	251,440	45,533	502
Washington	374,102	255,112	54,267	1,219
West Virginia	57,077	195,082	45,588	227
Wisconsin	331,625	353,313	95,261	614
Wyoming	21,202	302,620	323,833	310

S Withheld because estimate did not meet publication standards.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table A9.

Shipment Characteristics by Destination State: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Destination state	Value (million dollars)	Tons (thousands)	Ton-miles[1] (millions)	Average miles per shipment
Total	**14,517,812**	**12,468,902**	**3,116,876**	**679**
Alabama	218,200	186,953	48,399	700
Alaska	33,007	23,612	8,618	2,485
Arizona	199,583	137,282	51,083	839
Arkansas	118,496	147,907	39,477	609
California	1,537,200	821,882	265,519	803
Colorado	186,981	154,432	38,107	732
Connecticut	156,803	89,023	22,176	580
Delaware	44,113	27,061	4,387	358
District of Columbia	20,075	5,813	460	649
Florida	722,366	530,239	127,516	843
Georgia	479,322	309,263	98,532	689
Hawaii	39,824	29,816	7,422	2,129
Idaho	57,313	54,527	15,005	860
Illinois	721,202	585,433	122,442	493
Indiana	394,838	405,298	87,305	524
Iowa	174,201	292,161	47,440	523
Kansas	164,101	206,127	33,501	389
Kentucky	246,317	207,644	51,074	580
Louisiana	288,301	517,961	184,706	774
Maine	48,919	34,999	6,309	740
Maryland	204,632	161,647	46,987	550
Massachusetts	261,697	131,706	22,640	696
Michigan	545,647	391,828	94,254	506
Minnesota	262,751	329,401	69,172	547
Mississippi	138,574	112,032	28,069	705
Missouri	253,315	255,354	66,175	593
Montana	55,308	49,156	15,599	1,030
Nebraska	101,141	173,937	27,543	537
Nevada	91,677	47,898	16,958	779
New Hampshire	62,489	43,677	4,519	802
New Jersey	408,112	221,130	49,211	626
New Mexico	55,763	64,464	20,464	734
New York	699,233	361,208	65,595	634
North Carolina	384,795	267,370	78,822	743
North Dakota	58,784	117,297	20,132	659
Ohio	596,934	527,975	111,010	561
Oklahoma	162,426	193,728	49,581	545
Oregon	162,148	137,523	46,379	1,025
Pennsylvania	546,755	440,482	99,976	605
Rhode Island	30,621	17,343	2,186	642
South Carolina	219,324	149,139	43,218	679
South Dakota	39,807	61,594	8,409	645
Tennessee	357,660	250,527	58,125	660
Texas	1,746,834	1,976,425	462,171	569
Utah	128,041	107,637	34,990	861
Vermont	24,237	14,900	3,002	674
Virginia	302,091	271,940	62,119	685
Washington	373,082	300,594	133,331	1,054
West Virginia	66,874	121,785	19,079	664
Wisconsin	298,748	343,284	86,649	568
Wyoming	27,153	58,487	11,031	791

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Temperature Control Series

Table T1a.

Shipment Characteristics of Temperature Controlled[1] Shipments by Mode of Transportation for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Mode of transportation	Value		Tons		Ton-miles[2]		Average miles per shipment
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
All modes	**1,922,133**	**100.0**	**804,713**	**100.0**	**237,806**	**100.0**	**255**
Single modes	**1,730,700**	**90.0**	**778,082**	**96.7**	**212,929**	**89.5**	**127**
Truck[3]	1,659,015	86.3	711,984	88.5	192,851	81.1	117
For-hire truck	953,352	49.6	368,243	45.8	162,491	68.3	249
Company-owned truck	705,663	36.7	343,740	42.7	30,361	12.8	63
Rail	11,201	0.6	23,389	2.9	13,003	5.5	577
Water	15,972	0.8	36,197	4.5	6,245	2.6	585
Inland water	8,831	0.5	24,964	3.1	3,530	1.5	S
Great Lakes	S	S	S	S	S	S	S
Deep sea	6,777	0.4	11,048	1.4	2,691	1.1	646
Multiple waterways	363	Z	184	Z	S	S	S
Air (includes truck and air)	43,225	2.2	725	0.1	774	0.3	1,393
Pipeline[4]	1,286	0.1	5,787	0.7	S	S	S
Multiple modes	**191,433**	**10.0**	**26,632**	**3.3**	**24,877**	**10.5**	**866**
Parcel, U.S. Postal Service, or courier	152,777	7.9	545	0.1	377	0.2	866
Truck and rail	12,674	0.7	17,906	2.2	18,915	8.0	1,155
Truck and water	24,932	1.3	7,744	1.0	4,815	2.0	750
Rail and water	329	Z	S	S	S	S	1,997
Other multiple modes	720	Z	271	Z	464	0.2	1,788
Other modes	**S**	**S**	**S**	**S**	**S**	**S**	**S**

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[4] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table T1b.

Shipment Characteristics of Temperature Controlled[1] Shipments by Mode of Transportation for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

Mode of transportation	Value			Tons			Ton-miles[2]			Average miles per shipment		
	2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
All modes	**1,922,133**	**1,620,164**	**18.6**	**804,713**	**668,225**	**20.4**	**237,806**	**213,293**	**11.5**	**255**	**204**	**25.1**
Single modes	**1,730,700**	**1,465,548**	**18.1**	**778,082**	**659,921**	**17.9**	**212,929**	**204,550**	**4.1**	**127**	**138**	**–7.7**
Truck[3]	1,659,015	1,408,696	17.8	711,984	616,703	15.5	192,851	170,122	13.4	117	120	–2.2
For-hire truck	953,352	727,616	31.0	368,243	296,171	24.3	162,491	141,412	14.9	249	501	–50.3
Company-owned truck	705,663	681,080	3.6	343,740	320,532	7.2	30,361	28,710	5.7	63	61	3.3
Rail	11,201	23,977	–53.3	23,389	34,454	–32.1	13,003	28,636	–54.6	577	864	–33.2
Water	15,972	8,133	96.4	36,197	6,997	417.3	6,245	3,646	71.3	585	1,156	–49.4
Inland water	8,831	4,898	80.3	24,964	5,813	329.5	3,530	S	S	S	473	S
Great Lakes	S	S	S	S	S	S	S	S	S	S	S	S
Deep sea	6,777	2,859	137.0	11,048	721	1432.5	2,691	879	206.1	646	1,158	–44.2
Multiple waterways	363	376	–3.3	184	463	–60.2	S	188	S	S	1,708	S
Air (includes truck and air)	43,225	24,323	77.7	725	971	–25.4	774	1,714	–54.9	1,393	1,538	–9.5
Pipeline[4]	1,286	418	207.4	5,787	796	627.3	S	S	S	S	S	S
Multiple modes	**191,433**	**154,616**	**23.8**	**26,632**	**8,304**	**220.7**	**24,877**	**8,744**	**184.5**	**866**	**688**	**25.9**
Parcel, U.S. Postal Service, or courier	152,777	144,887	5.4	545	502	8.5	377	288	31.0	866	686	26.2
Truck and rail	12,674	6,835	85.4	17,906	5,377	233.0	18,915	6,883	174.8	1,155	706	63.7
Truck and water	24,932	2,574	868.8	7,744	919	742.8	4,815	1,452	231.7	750	981	–23.6
Rail and water	329	S	S	S	S	S	S	122	S	1,997	S	S
Other multiple modes	720	S	S	271	S	S	464	S	S	1,788	S	S
Other modes	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**

S Withheld because estimate did not meet publication standards.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[4] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table T2a.

Shipment Characteristics of Temperature Controlled[1] Shipments by Total Modal Activity for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Mode of transportation[2]	Ton-miles[3]		Average miles per shipment
	2017 (millions)	Percent of total	
Total	**237,806**	**100.0**	**253**
Truck[4]	195,854	82.4	117
Rail	32,347	13.6	915
Inland water	3,707	1.6	1,041
Great Lakes	S	S	S
Deep sea	4,730	2.0	436
Air	736	0.3	1,209
Pipeline[5]	S	S	S
Parcel, U.S. Postal Service, or courier	376	0.2	865
Other modes	S	S	S

S Withheld because estimate did not meet publication standards.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Estimates represent activity for a given mode across single and multiple mode shipments. For example, "Truck" ton-miles includes total ton-miles for shipments moving only by truck plus ton-miles for truck segments of multiple mode shipments.

[3] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[4] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[5] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table T2b.

Shipment Characteristics of Temperature Controlled[1] Shipments by Total Modal Activity for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

Mode of transportation[2]	Ton-miles[3]			Average miles per shipment		
	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
Total	**237,806**	**213,293**	**11.5**	**253**	**201**	**25.5**
Truck[4]	195,854	170,917	14.6	117	119	–2.2
Rail	32,347	35,438	–8.7	915	779	17.4
Inland water	3,707	3,040	21.9	1,041	328	217.1
Great Lakes	S	S	S	S	757	S
Deep sea	4,730	2,037	132.2	436	1,057	–58.7
Air	736	S	S	1,209	1,349	–10.3
Pipeline[5]	S	S	S	S	S	S
Parcel, U.S. Postal Service, or courier	376	286	31.5	865	682	26.9
Other modes	S	S	S	S	S	S

S Withheld because estimate did not meet publication standards.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Estimates represent activity for a given mode across single and multiple mode shipments. For example, "Truck" ton-miles includes total ton-miles for shipments moving only by truck plus ton-miles for truck segments of multiple mode shipments.

[3] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[4] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[5] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table T3a.

Shipment Characteristics of Temperature Controlled[1] Shipments by Distance Shipped for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Distance shipped[2] (Based on Great Circle Distance)	Value		Tons		Ton-miles[3]	
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total
Total	**1,922,133**	**100.0**	**804,713**	**100.0**	**237,806**	**100.0**
Less than 50 miles	630,289	32.8	337,646	42.0	8,021	3.4
50 to 99 miles	254,979	13.3	115,838	14.4	10,709	4.5
100 to 249 miles	392,194	20.4	154,973	19.3	31,775	13.4
250 to 499 miles	225,155	11.7	82,415	10.2	35,919	15.1
500 to 749 miles	137,302	7.1	38,599	4.8	30,278	12.7
750 to 999 miles	90,082	4.7	27,859	3.5	30,927	13.0
1,000 to 1,499 miles	83,266	4.3	26,297	3.3	39,974	16.8
1,500 to 1,999 miles	67,583	3.5	12,559	1.6	26,712	11.2
2,000 miles or more	41,282	2.1	8,528	1.1	23,490	9.9

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Shipments are grouped into distance categories based on Great Circle Distance (GCD). GCD is the shortest distance between two points on the surface of a sphere over the surface of that sphere.

[3] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The “Reliability of Estimates” tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table T3b.

Shipment Characteristics of Temperature Controlled[1] Shipments by Distance Shipped for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

Distance shipped[2] (Based on Great Circle Distance)	Value			Tons			Ton-miles[3]		
	2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change
Total	**1,922,133**	**1,620,164**	**18.6**	**804,713**	**668,225**	**20.4**	**237,806**	**213,293**	**11.5**
Less than 50 miles	630,289	528,448	19.3	337,646	256,826	31.5	8,021	6,296	27.4
50 to 99 miles	254,979	249,745	2.1	115,838	100,502	15.3	10,709	9,096	17.7
100 to 249 miles	392,194	336,574	16.5	154,973	132,871	16.6	31,775	26,096	21.8
250 to 499 miles	225,155	210,243	7.1	82,415	70,427	17.0	35,919	32,666	10.0
500 to 749 miles	137,302	102,207	34.3	38,599	39,142	–1.4	30,278	30,564	–0.9
750 to 999 miles	90,082	66,205	36.1	27,859	27,304	2.0	30,927	30,186	2.5
1,000 to 1,499 miles	83,266	66,632	25.0	26,297	23,563	11.6	39,974	35,523	12.5
1,500 to 1,999 miles	67,583	33,675	100.7	12,559	9,894	26.9	26,712	21,033	27.0
2,000 miles or more	41,282	26,434	56.2	8,528	7,696	10.8	23,490	21,835	7.6

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Shipments are grouped into distance categories based on Great Circle Distance (GCD). GCD is the shortest distance between two points on the surface of a sphere over the surface of that sphere.

[3] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The “Reliability of Estimates” tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions

Table T4a.

Shipment Characteristics of Temperature Controlled[1] Shipments by Shipment Weight for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Shipment weight	Value		Tons		Ton-miles[2]		Average miles per shipment
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
Total	**1,922,133**	**100.0**	**804,713**	**100.0**	**237,806**	**100.0**	**255**
Less than 50 lbs	164,775	8.6	2,030	0.3	487	0.2	384
50 to 99 lbs	44,597	2.3	1,980	0.2	213	0.1	109
100 to 499 lbs	121,014	6.3	17,030	2.1	1,685	0.7	99
500 to 749 lbs	47,021	2.4	10,306	1.3	1,125	0.5	109
750 to 999 lbs	39,326	2.0	9,440	1.2	1,090	0.5	115
1,000 to 9,999 lbs	552,860	28.8	148,289	18.4	29,109	12.2	169
10,000 to 49,999 lbs	869,063	45.2	444,554	55.2	154,749	65.1	339
50,000 to 99,999 lbs	48,907	2.5	91,603	11.4	14,457	6.1	157
100,000 lbs or more	34,569	1.8	79,482	9.9	34,891	14.7	760

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The “Reliability of Estimates” tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table T4b.

Shipment Characteristics of Temperature Controlled[1] Shipments by Shipment Weight for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

Shipment weight	Value			Tons			Ton-miles[2]			Average miles per shipment		
	2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
Total	**1,922,133**	**1,620,164**	**18.6**	**804,713**	**668,225**	**20.4**	**237,806**	**213,293**	**11.5**	**255**	**204**	**25.1**
Less than 50 lbs	164,775	133,997	23.0	2,030	1,519	33.7	487	361	34.9	384	338	13.6
50 to 99 lbs	44,597	46,571	–4.2	1,980	1,812	9.2	213	188	13.4	109	104	5.1
100 to 499 lbs	121,014	116,623	3.8	17,030	14,960	13.8	1,685	1,427	18.0	99	94	4.8
500 to 749 lbs	47,021	38,969	20.7	10,306	8,769	17.5	1,125	884	27.3	109	100	8.8
750 to 999 lbs	39,326	37,350	5.3	9,440	8,155	15.8	1,090	884	23.3	115	108	6.4
1,000 to 9,999 lbs	552,860	419,944	31.7	148,289	130,820	13.4	29,109	24,111	20.7	169	163	4.0
10,000 to 49,999 lbs	869,063	744,095	16.8	444,554	383,318	16.0	154,749	136,958	13.0	339	335	1.2
50,000 to 99,999 lbs	48,907	42,318	15.6	91,603	64,988	41.0	14,457	10,316	40.1	157	153	2.1
100,000 lbs or more	34,569	40,297	–14.2	79,482	53,884	47.5	34,891	38,164	–8.6	760	820	–7.3

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The “Reliability of Estimates” tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table T5a.

Shipment Characteristics of Temperature Controlled[1] Shipments by Two-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value		Tons		Ton-miles[2]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
	All commodities[3]	**1,922,133**	**100.0**	**804,713**	**100.0**	**237,806**	**100.0**	**255**
01	Live animals and live fish	2,394	0.1	404	0.1	281	0.1	1,000
02	Cereal grains (includes seed)	S	S	S	S	S	S	116
03	Agricultural products (excludes animal feed, cereal grains, and forage products)	105,222	5.5	65,869	8.2	30,361	12.8	342
04	Animal feed, eggs, honey, and other products of animal origin	14,157	0.7	8,481	1.1	2,267	1.0	77
05	Meat, poultry, fish, seafood, and their preparations	344,343	17.9	92,145	11.5	45,041	18.9	239
06	Milled grain products and preparations and bakery products	49,767	2.6	23,242	2.9	11,051	4.6	160
07	Other prepared foodstuffs and fats and oils	246,159	12.8	135,342	16.8	59,293	24.9	150
08	Alcoholic beverages, and denatured alcohol	33,460	1.7	13,107	1.6	2,741	1.2	261
09	Tobacco products	2,043	0.1	79	Z	19	Z	261
10	Monumental or building stone	S	S	S	S	S	S	S
11	Natural sands	S	S	460	0.1	S	S	S
12	Gravel and crushed stone (excludes dolomite and slate)	1	Z	S	S	S	S	13
13	Other nonmetallic minerals, n.e.c.	47	Z	1,242	0.2	S	S	30
14	Metallic ores and concentrates	423	Z	S	S	S	S	S
15	Coal	S	S	S	S	S	S	S
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	4,648	0.2	9,282	1.2	3,179	1.3	159
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	7,104	0.4	12,177	1.5	2,593	1.1	S
19	Other coal and petroleum products, n.e.c.	29,008	1.5	113,232	14.1	13,244	5.6	52
20	Basic chemicals	30,724	1.6	84,894	10.5	17,195	7.2	315
21	Pharmaceutical products	425,602	22.1	3,974	0.5	1,779	0.7	411
22	Fertilizers	6,292	0.3	23,939	3.0	7,491	3.2	119
23	Chemical products and preparations, n.e.c.	32,366	1.7	10,626	1.3	6,186	2.6	794
24	Plastics and rubber	3,328	0.2	1,135	0.1	766	0.3	383
25	Logs and other wood in the rough	S	S	7	Z	S	S	885
26	Wood products	207	Z	S	S	72	Z	S
27	Pulp, newsprint, paper, and paperboard	160	Z	S	S	S	S	S
28	Paper or paperboard articles	171	Z	216	Z	45	Z	96
29	Printed products	607	Z	55	Z	29	Z	619
30	Textiles, leather, and articles of textiles or leather	394	Z	35	Z	S	S	S
31	Nonmetallic mineral products	1,057	0.1	4,961	0.6	S	S	181
32	Base metal in primary or semifinished forms and in finished basic shapes	822	Z	303	Z	65	Z	342
33	Articles of base metal	453	Z	59	Z	11	Z	S
34	Machinery	2,597	0.1	149	Z	30	Z	832
35	Electronic and other electrical equipment and components and office equipment	1,526	0.1	82	Z	48	Z	867
36	Motorized and other vehicles (including parts)	1,671	0.1	S	S	105	Z	238
37	Transportation equipment, n.e.c.	38	Z	Z	Z	S	S	369
38	Precision instruments and apparatus	2,612	0.1	32	Z	33	Z	S
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	S	S	S	S	S	S	S

See footnotes at end of table.

Table T5a.

Shipment Characteristics of Temperature Controlled[1] Shipments by Two-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value		Tons		Ton-miles[2]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
40	Miscellaneous manufactured products	1,402	0.1	173	Z	49	Z	992
41	Waste and scrap	S	S	S	S	S	S	S
43	Mixed freight	570,883	29.7	196,911	24.5	32,386	13.6	108
99	Commodity unknown	X	X	X	X	X	X	X

S Withheld because estimate did not meet publication standards.
X Not applicable.
Z Rounds to zero.
[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.
[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[3] Estimates exclude shipments of crude petroleum (SCTG 16).
Note: Value-of-shipments estimates have not been adjusted for price changes. The “Reliability of Estimates” tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions

Table T5b.

Shipment Characteristics of Temperature Controlled Shipments[1] by Two-Digit Commodity for the United States: 2017 and 2012—Con.

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value			Tons			Ton-miles[2]			Average miles per shipment		
		2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
	All commodities[3]	**1,922,133**	**1,620,164**	**18.6**	**804,713**	**668,225**	**20.4**	**237,806**	**213,293**	**11.5**	**255**	**204**	**25.1**
01	Live animals and live fish	2,394	652	267.0	404	121	233.3	281	S	S	1,000	548	82.6
02	Cereal grains (includes seed)	S	S	S	S	S	S	S	S	S	116	48	140.8
03	Agricultural products (excludes animal feed, cereal grains, and forage products)	105,222	61,186	72.0	65,869	45,509	44.7	30,361	21,361	42.1	342	322	6.3
04	Animal feed, eggs, honey, and other products of animal origin	14,157	7,599	86.3	8,481	7,105	19.4	2,267	2,741	–17.3	77	181	–57.5
05	Meat, poultry, fish, seafood, and their preparations	344,343	298,454	15.4	92,145	88,965	3.6	45,041	43,080	4.6	239	181	32.2
06	Milled grain products and preparations and bakery products	49,767	42,097	18.2	23,242	19,724	17.8	11,051	10,306	7.2	160	164	–2.5
07	Other prepared foodstuffs and fats and oils	246,159	213,234	15.4	135,342	134,884	0.3	59,293	54,374	9.0	150	109	38.0
08	Alcoholic beverages, and denatured alcohol	33,460	21,212	57.7	13,107	10,691	22.6	2,741	5,209	–47.4	261	104	152.1
09	Tobacco products	2,043	3,445	–40.7	79	126	–37.7	19	18	8.7	261	99	163.5
10	Monumental or building stone	S	S	S	S	S	S	S	S	S	S	S	S
11	Natural sands	S	S	S	460	S	S	S	S	S	S	S	S
12	Gravel and crushed stone (excludes dolomite and slate)	1	S	S	S	74	S	S	S	S	13	29	–54.9
13	Other nonmetallic minerals, n.e.c.	47	72	–34.5	1,242	514	141.7	S	71	S	30	S	S
14	Metallic ores and concentrates	423	S	S	S	S	S	S	S	S	S	30	S
15	Coal	S	S	S	S	S	S	S	S	S	S	S	S
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	4,648	1,154	302.9	9,282	1,648	463.1	3,179	1,215	161.7	159	S	S
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	7,104	S	S	12,177	S	S	2,593	S	S	S	584	S
19	Other coal and petroleum products, n.e.c.	29,008	37,662	–23.0	113,232	90,976	24.5	13,244	12,742	3.9	52	58	–10.1
20	Basic chemicals	30,724	33,796	–9.1	84,894	52,893	60.5	17,195	21,078	–18.4	315	409	–22.9
21	Pharmaceutical products	425,602	332,516	28.0	3,974	2,345	69.5	1,779	1,157	53.8	411	614	–33.0
22	Fertilizers	6,292	6,598	–4.6	23,939	13,233	80.9	7,491	6,156	21.7	119	565	–78.9
23	Chemical products and preparations, n.e.c.	32,366	20,108	61.0	10,626	6,133	73.2	6,186	3,646	69.7	794	607	30.8
24	Plastics and rubber	3,328	2,659	25.2	1,135	810	40.2	766	616	24.2	383	453	–15.5
25	Logs and other wood in the rough	S	S	S	7	S	S	S	S	S	885	S	S
26	Wood products	207	S	S	S	S	S	72	S	S	S	S	S
27	Pulp, newsprint, paper, and paperboard	160	1	18631.4	S	S	S	S	S	S	S	S	S
28	Paper or paperboard articles	171	18	869.8	216	4	4720.9	45	Z	26331.9	96	60	60.1
29	Printed products	607	S	S	55	S	S	29	1	4906.6	619	1,314	–52.9
30	Textiles, leather, and articles of textiles or leather	394	493	–20.2	35	49	–28.6	S	30	S	S	522	S
31	Nonmetallic mineral products	1,057	330	220.7	4,961	2,693	84.2	S	103	S	181	277	–34.6
32	Base metal in primary or semifinished forms and in finished basic shapes	822	810	1.5	303	S	S	65	42	56.6	342	S	S
33	Articles of base metal	453	S	S	59	S	S	11	S	S	S	431	S
34	Machinery	2,597	464	459.2	149	S	S	30	S	S	832	562	48.0
35	Electronic and other electrical equipment and components and office equipment	1,526	S	S	82	S	S	48	S	S	867	S	S
36	Motorized and other vehicles (including parts)	1,671	S	S	S	S	S	105	S	S	238	S	S
37	Transportation equipment, n.e.c.	38	S	S	Z	S	S	S	S	S	369	S	S
38	Precision instruments and apparatus	2,612	4,045	–35.4	32	79	–59.9	33	99	–66.4	S	674	S
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	S	270	S	S	S	S	S	S	S	S	657	S

See footnotes at end of table.

Table T5b.

Shipment Characteristics of Temperature Controlled Shipments[1] by Two-Digit Commodity for the United States: 2017 and 2012—Con.

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value			Tons			Ton-miles[2]			Average miles per shipment		
		2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
40	Miscellaneous manufactured products	1,402	S	S	173	42	312.7	49	25	97.0	992	505	96.3
41	Waste and scrap	S	S	S	S	S	S	S	S	S	S	S	S
43	Mixed freight	570,883	529,281	7.9	196,911	187,669	4.9	32,386	28,825	12.4	108	108	0.2
99	Commodity unknown	X	24	X	X	S	X	X	S	X	X	94	X

S Withheld because estimate did not meet publication standards.

X Not applicable.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] Estimates exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The “Reliability of Estimates” tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table T6.

Shipment Characteristics of Temperature Controlled[1] Shipments by Three-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value		Tons		Ton-miles[2]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
	All commodities[3]	**1,922,133**	**100.0**	**804,713**	**100.0**	**237,806**	**100.0**	**255**
010	Live animals and live fish	2,394	0.1	404	0.1	281	0.1	1,000
021	Wheat	S	S	S	S	S	S	S
022	Corn, except sweet	S	S	S	S	S	S	115
029	Other cereal grains	S	S	S	S	S	S	S
031	Fresh or chilled potatoes, except sweet	8,505	0.4	7,838	1.0	4,850	2.0	201
032	Fresh or chilled edible vegetables (except potatoes), and dried vegetables	38,973	2.0	25,652	3.2	11,006	4.6	98
033	Fruit and nuts, edible, fresh, chilled, or dried	47,026	2.4	29,084	3.6	12,640	5.3	505
034	Soy beans	490	Z	1,561	0.2	S	S	S
035	Oil seeds and nuts, except olives and soy beans	145	Z	59	Z	S	S	302
036	Bulbs, live plants, and seeds for sowing, n.e.c.	S	S	382	Z	239	0.1	809
039	Fresh-cut flowers, plants, and parts of plants, and other agricultural products	5,972	0.3	1,294	0.2	1,051	0.4	S
041	Eggs, cereal straw or husks, forage products, residues and waste from the food industries used in animal feeding, other products of animal origin, n.e.c.	11,940	0.6	5,143	0.6	1,840	0.8	76
042	Animal feed preparations	2,218	0.1	S	S	427	0.2	S
051	Meat and poultry, fresh, chilled, or frozen, meat in brine, dried or smoked	286,504	14.9	83,749	10.4	40,232	16.9	276
052	Fish (except live), seafood, and their preparations	55,890	2.9	7,787	1.0	4,508	1.9	184
053	Preparations, extracts, and juices of meat, fish, or seafood	1,949	0.1	610	0.1	300	0.1	181
061	Wheat flour, groats, and meal	1,018	0.1	404	0.1	65	Z	S
062	Malt, milled rice and corn (broken, flour, groats, and meal, inulin, wheat gluten, milled cereals and other vegetables and grains)	807	Z	1,237	0.2	1,145	0.5	175
063	Bakery products and food preparations of cereals, flour, starch or milk	11,483	0.6	5,934	0.7	2,660	1.1	138
064	Bakery products, including frozen	36,459	1.9	15,667	1.9	7,181	3.0	173
071	Dairy products except beverages and preparations of milk	142,864	7.4	73,144	9.1	24,283	10.2	93
072	Processed or prepared vegetables, fruit, or nuts, except dried or milled, and juices	31,996	1.7	21,231	2.6	12,564	5.3	212
073	Coffee, tea, and spices, except unprocessed coffee and unfermented tea	1,664	0.1	985	0.1	569	0.2	110
074	Animal or vegetable fats, oils, waxes, and their cleavage products, prepared edible fats, and flours and meals of oil seeds (excludes oils and fats for use as biodiesel)	8,216	0.4	7,085	0.9	3,457	1.5	169
075	Sugars confectionery, solid or syrups not containing added flavoring or coloring	640	Z	930	0.1	444	0.2	133
076	Confectionery, cocoa, and cocoa preparations	25,043	1.3	6,191	0.8	4,071	1.7	766
077	Edible preparations, n.e.c., and vinegar	21,133	1.1	9,082	1.1	5,661	2.4	262
078	Nonalcoholic beverages, n.e.c., and ice	14,603	0.8	16,694	2.1	8,243	3.5	89
081	Malt beer	16,303	0.8	10,004	1.2	1,694	0.7	33
082	Wine and other fermented beverages	13,739	0.7	2,420	0.3	980	0.4	489
083	Spirituous beverages and undenatured ethyl alcohol	3,329	0.2	583	0.1	59	Z	50
084	Denatured ethyl alcohol, not for ingestion or use as biofuel	S	S	S	S	S	S	1,208
090	Tobacco products	2,043	0.1	79	Z	19	Z	261
100	Monumental or building stone, except dolomite	S	S	S	S	S	S	S
110	Natural sands, except metal-bearing	S	S	460	0.1	S	S	S
120	Gravel and crushed stone, except dolomite and slate	1	Z	S	S	S	S	13
131	Salt	S	S	9	Z	1	Z	65
132	Natural calcium phosphates, natural aluminum-calcium phosphates, and phosphatic chalk	S	S	S	S	S	S	S
133	Dolomite, including monumental, building, and crushed	S	S	S	S	S	S	S
139	Other nonmetallic minerals, n.e.c.	37	Z	1,234	0.2	S	S	S
141	Iron ores and concentrates	S	S	S	S	S	S	S
149	Metallic ores and concentrates, except iron	423	Z	S	S	S	S	S
151	Nonagglomerated bituminous coal	S	S	S	S	S	S	S
159	Coal, except nonagglomerated bituminous coal	S	S	S	S	S	S	S

See footnotes at end of table.

Table T6.

Shipment Characteristics of Temperature Controlled[1] Shipments by Three-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value		Tons		Ton-miles[2]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
171	Gasoline, and blends of gasoline and 10 percent ethanol	S	S	8	Z	S	S	28
172	Aviation turbine fuel (types a and b), and kerosene	1,155	0.1	2,541	0.3	255	0.1	64
175	Ethanol, ethanol blends of more than 10 percent ethanol, and other fuel alcohols	1,797	0.1	3,450	0.4	2,071	0.9	339
176	Ethanol, for use as biofuels	1,678	0.1	3,283	0.4	853	0.4	154
181	Fuel oils	S	S	S	S	S	S	S
182	Blends of fuel oils and biofuel, biodiesel	4,399	0.2	6,346	0.8	1,988	0.8	130
191	Lubricating oils and greases	499	Z	332	Z	149	0.1	63
192	Refined petroleum oils and oils obtained from bituminous minerals, n.e.c.	701	Z	1,517	0.2	376	0.2	196
193	Gaseous hydrocarbons	2,077	0.1	3,774	0.5	228	0.1	21
199	Other products of petroleum refining, and coal products, n.e.c.	25,731	1.3	107,608	13.4	12,491	5.3	82
201	Sodium hydroxide (caustic soda) and potassium hydroxide (caustic potash)	629	Z	1,387	0.2	S	S	101
202	Inorganic chemicals, n.e.c.	10,657	0.6	71,322	8.9	9,945	4.2	92
203	Cyclic hydrocarbons	3,202	0.2	3,612	0.4	1,103	0.5	171
204	Phenols, phenol-alcohols, aldehydes, cyclic polymers of aldehydes, and acyclic alcohols, and organic acids	3,696	0.2	2,906	0.4	1,944	0.8	626
205	Organic chemicals, n.e.c.	12,540	0.7	5,667	0.7	4,023	1.7	815
210	Pharmaceutical products	425,602	22.1	3,974	0.5	1,779	0.7	411
220	Fertilizers and fertilizer materials	6,292	0.3	23,939	3.0	7,491	3.2	119
231	Paints and varnishes, enamels, tanning or dyeing extracts, tannins and their derivatives, inks, lakes, toners, and ink	9,061	0.5	2,415	0.3	933	0.4	189
232	Essential oils and resinoids, and perfumery, cosmetic, or toilet preparations	6,493	0.3	848	0.1	768	0.3	923
233	Soap, organic surface-active agents, cleaning preparations, polishes and creams, and scouring preps	2,478	0.1	1,279	0.2	1,216	0.5	757
234	Photographic film, plates, paper, paperboard, or textiles, and chemical preps for photographic use	2,997	0.2	349	Z	S	S	715
235	Insecticides, rodenticides, fungicides, herbicides, disinfectants, etc.	1,050	0.1	167	Z	40	Z	S
239	Other chemical products and preparations: glues, prepared explosives, activated natural mineral products, anti-knock preparations, etc.	10,286	0.5	5,568	0.7	2,628	1.1	599
241	Plastics and rubber in primary forms or sheets	340	Z	178	Z	104	Z	503
242	Manmade fibers and plastics basic shapes and articles	2,839	0.1	935	0.1	645	0.3	460
243	Rubber articles	149	Z	S	S	S	S	S
250	Logs and other wood in the rough	S	S	7	Z	S	S	885
261	Wood chips or particles	S	S	S	S	S	S	103
262	Lumber, wood continuously shaped along any of its edges or faces, shingles and shakes	S	S	S	S	S	S	57
263	Veneer sheets and sheets for plywood, particle board, fiberboard, plywood, and similar laminated wood	S	S	S	S	S	S	67
264	Windows, doors, thresholds, and builders' joinery and carpentry of wood, except shingles and shakes	S	S	S	S	S	S	S
269	Other wood products	S	S	S	S	S	S	S
271	Pulp of fibrous cellulosic materials	S	S	S	S	S	S	S
272	Newsprint in large rolls or sheets	S	S	S	S	S	S	S
273	Uncoated paper, tissue, and paperboard in large rolls or sheets	100	Z	S	S	S	S	218
274	Coated, impregnated, treated, or worked paper and paperboard, in large rolls or sheets	53	Z	S	S	S	S	S
280	Paper or paperboard articles	171	Z	216	Z	45	Z	96
291	Printed books, brochures, leaflets, and similar printed products	S	S	S	S	S	S	668
292	Newspapers, journals, and periodicals	S	S	S	S	S	S	S
293	Advertising material, commercial or trade catalogues, and similar printed products	66	Z	16	Z	3	Z	493
299	Other printed products	348	Z	22	Z	15	Z	320

See footnotes at end of table.

Table T6.

Shipment Characteristics of Temperature Controlled[1] Shipments by Three-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value		Tons		Ton-miles[2]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
301	Textile fibers, yarns, and broad woven or knitted fabrics	S	S	S	S	S	S	S
302	Textile clothing and accessories, and headgear, except safety	S	S	S	S	S	S	S
303	Textiles and textile articles, n.e.c.	54	Z	S	S	S	S	S
304	Leather footwear	48	Z	S	S	S	S	S
305	Leather and articles of leather or allied materials, and dressed fur skins	30	Z	9	Z	S	S	S
311	Hydraulic cements	369	Z	4,519	0.6	S	S	74
312	Ceramic products	88	Z	24	Z	S	S	S
313	Glass and glass products	499	Z	86	Z	28	Z	429
319	Other nonmetallic mineral products	101	Z	S	S	18	Z	S
321	Ferro-alloys, and iron and steel in primary or semi-finished forms, or in powders or granules	S	S	S	S	S	S	S
322	Flat-rolled products of iron or steel	207	Z	120	Z	22	Z	107
323	Bars, rods, angles, shapes, sections, and wire, of iron or steel	S	S	34	Z	S	S	S
324	Nonferrous metal, except precious, unwrought, or in finished basic shapes, or in powders orgranules	349	Z	121	Z	S	S	S
331	Pipes, tubes, and fittings	130	Z	S	S	3	Z	S
332	Structures and parts, except prefabricated buildings	S	S	S	S	S	S	S
333	Hand tools, cutlery, except of precious metals, interchangeable tools for hand or machine tools, hardware, and industrial fasteners	16	Z	4	Z	S	S	S
339	Other articles of metal	S	S	45	Z	S	S	S
341	Internal-combustion engines and parts	S	S	S	S	S	S	264
342	Turbines, boilers, nuclear reactors, and nonelectric engines and motors, except internal-combustion	502	Z	S	S	S	S	984
343	Pumps, compressors, fans, and ventilating or recycling hoods incorporating a fan	S	S	S	S	S	S	1,063
344	Air-conditioning, refrigerating, or freezing equipment	98	Z	S	S	6	Z	S
345	Materials-handling, excavating, boring, and related machinery and equipment	S	S	S	S	S	S	S
349	Other mechanical machinery, n.e.c.	768	Z	S	S	5	Z	186
351	Electric motors, generators, rotary or static converters, and transformers	S	S	S	S	S	S	S
352	Electric cooking appliances, electro-thermic, or electro-mechanical domestic appliances	101	Z	6	Z	1	Z	282
353	Line telephone or telegraph apparatus	S	S	S	S	S	S	S
354	Electronic entertainment products, except parts	S	S	S	S	S	S	S
355	Computer and electronic office equipment	S	S	S	S	S	S	S
356	Prepared unrecorded or prerecorded media	S	S	S	S	S	S	S
357	Transmission, and reception apparatus for radio, television, radar, and remote-control	819	Z	1	Z	2	Z	1,133
358	Electronic components and parts	S	S	S	S	S	S	1,242
359	Other electronic and electrical equipment, n.e.c.	356	Z	39	Z	32	Z	S
361	Motorized vehicles for transport of less than 10 people, except motorcycles, armored, and recreational	S	S	S	S	S	S	S
362	Motor vehicles for the transport of goods, and road tractors for semi-trailers	S	S	S	S	S	S	S
363	Other vehicles	913	Z	S	S	82	Z	S
364	Motor vehicles parts and accessories, except motorcycles and armored fighting vehicles	583	Z	37	Z	S	S	225
371	Railway equipment including locomotives and rolling stock, railway track fixtures and fittings, and parts	S	S	S	S	S	S	S
372	Aircraft and spacecraft	38	Z	Z	Z	S	S	369
373	Ships, boats, and floating structures	S	S	S	S	S	S	S
381	Optical elements, instruments, and apparatus, except photographic and cinematographic	S	S	S	S	S	S	438
382	Photographic and photocopying machines	S	S	S	S	2	Z	S
383	Surveying, hydrographic, oceanographic, hydrological, meteorological, and geophysical instruments and appliances	S	S	S	S	S	S	1,029

See footnotes at end of table.

Table T6.

Shipment Characteristics of Temperature Controlled[1] Shipments by Three-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value		Tons		Ton-miles[2]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
384	Instruments, apparatus, and appliances for medical, surgical, dental, veterinary, or similar purposes	S	S	S	S	S	S	1,177
385	Meters and other instruments and apparatus for measuring or process control	1,506	0.1	20	Z	27	Z	1,154
390	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	S	S	S	S	S	S	S
401	Arms and ammunition	S	S	S	S	S	S	1,108
402	Toys, games, and sporting equipment	205	Z	10	Z	S	S	1,017
409	Miscellaneous manufactured products	1,187	0.1	163	Z	42	Z	970
411	Metallic waste and scrap	S	S	S	S	S	S	S
412	Nonmetallic waste and scrap, except from food processing	S	S	S	S	S	S	S
439	Mixed freight	570,883	29.7	196,911	24.5	32,386	13.6	108
999	Commodity unknown	X	X	X	X	X	X	X

S Withheld because estimate did not meet publication standards.
X Not applicable.
Z Rounds to zero.
[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.
[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[3] Estimates exclude shipments of crude petroleum (SCTG 16).
Note: Value-of-shipments estimates have not been adjusted for price changes. The “Reliability of Estimates” tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table T7a.

Shipment Characteristics of Temperature Controlled[1] Shipments by NAICS[2] for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

NAICS code	NAICS description	Value (million dollars)	Tons (thousands)	Ton-miles[3] (millions)	Average miles per shipment
	Total	**1,922,133**	**804,713**	**237,806**	**255**
212	Mining (except oil and gas)	500	1,749	S	S
31–33	Manufacturing	656,701	387,042	148,042	404
311	Food manufacturing	453,142	196,537	102,355	266
312	Beverage and tobacco product manufacturing	11,812	10,285	4,265	780
313	Textile mills	S	S	S	S
314	Textile product mills	S	S	S	S
315	Apparel manufacturing	S	S	S	S
316	Leather and allied product manufacturing	S	83	78	S
321	Wood product manufacturing	145	S	S	276
322	Paper manufacturing	282	S	S	656
323	Printing and related support activities	777	68	47	661
324	Petroleum and coal products manufacturing	20,943	86,471	10,033	89
325	Chemical manufacturing	158,997	86,334	29,461	847
326	Plastics and rubber products manufacturing	1,851	479	254	430
327	Nonmetallic mineral product manufacturing	691	4,927	S	S
331	Primary metal manufacturing	711	337	73	350
332	Fabricated metal product manufacturing	1,059	204	S	584
333	Machinery manufacturing	1,158	128	112	876
334	Computer and electronic product manufacturing	S	9	7	1,240
335	Electrical equipment, appliance, and component manufacturing	668	48	44	825
336	Transportation equipment manufacturing	1,002	S	S	S
337	Furniture and related product manufacturing	S	S	S	927
339	Miscellaneous manufacturing	1,712	32	31	1,057
42	Wholesale trade	974,993	336,576	75,712	140
423	Merchant wholesalers, durable goods	19,881	6,850	977	231
4231	Motor vehicle and motor vehicle parts and supplies merchant wholesalers	1,410	S	S	110
4232	Furniture and home furnishing merchant wholesalers	16	S	S	S
4233	Lumber and other construction materials merchant wholesalers	450	3,350	67	38
4234	Professional and commercial equipment and supplies merchant wholesalers	14,838	984	533	273
4235	Metal and mineral (except petroleum) merchant wholesalers	6	1	Z	517
4236	Electrical and electronic goods merchant wholesalers	S	S	S	1,590
4237	Hardware, plumbing and heating equipment and supplies merchant wholesalers	348	210	S	S
4238	Machinery, equipment, and supplies merchant wholesalers	1,778	769	85	89
4239	Miscellaneous durable goods merchant wholesalers	1,009	661	S	428
424	Merchant wholesalers, nondurable goods	955,112	329,726	74,735	135
4241	Paper and paper product merchant wholesalers	1,113	S	S	482
4242	Drugs and druggists' sundries merchant wholesalers	234,413	1,380	537	299
4243	Apparel, piece goods, and notions merchant wholesalers	377	212	177	1,069
4244	Grocery and related product merchant wholesalers	614,248	234,659	59,784	117
4245	Farm product raw material merchant wholesalers	S	5,199	1,393	S
4246	Chemical and allied products merchant wholesalers	9,626	27,006	4,194	83
4247	Petroleum and petroleum products merchant wholesalers	11,415	35,507	S	51
4248	Beer, wine, and distilled alcoholic beverage merchant wholesalers	25,040	8,642	592	109
4249	Miscellaneous nondurable goods merchant wholesalers	47,821	16,822	3,337	278
4541	Electronic shopping and mail-order houses	45,207	667	264	748
45431	Fuel dealers	1,125	1,689	37	19
4931[4]	Warehousing and storage	209,894	66,622	10,602	231
5111	Newspaper, periodical, book, and directory publishers	S	S	S	S
551114	Corporate, subsidiary, and regional managing offices	33,712	10,369	3,024	743

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] NAICS codes shown are those covered in the Commodity Flow Survey.

[3] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[4] For tabulation and publication purposes, NAICS 484 is grouped with NAICS 4931.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table T7b.

Shipment Characteristics of Temperature Controlled[1] Shipments by NAICS[2] for the United States: 2017 and 2012—Con.

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

NAICS code	NAICS description	Value			Tons			Ton-miles[3]			Average miles per shipment		
		2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
	Total	**1,922,133**	**1,620,164**	**18.6**	**804,713**	**668,225**	**20.4**	**237,806**	**213,293**	**11.5**	**255**	**204**	**25.1**
212	Mining (except oil and gas)	500	S	S	1,749	882	98.3	S	S	S	S	71	S
31–33	Manufacturing	656,701	569,249	15.4	387,042	318,489	21.5	148,042	144,352	2.6	404	339	19.3
311	Food manufacturing	453,142	405,845	11.7	196,537	190,801	3.0	102,355	98,950	3.4	266	214	24.2
312	Beverage and tobacco product manufacturing	11,812	11,049	6.9	10,285	14,620	-29.7	4,265	7,847	-45.7	780	225	245.8
313	Textile mills	S	S	S	S	S	S	S	S	S	S	S	S
314	Textile product mills	S	S	S	S	S	S	S	S	S	S	S	S
315	Apparel manufacturing	S	S	S	S	S	S	S	S	S	S	S	S
316	Leather and allied product manufacturing	S	S	S	83	S	S	78	S	S	S	1,172	S
321	Wood product manufacturing	145	S	S	S	S	S	S	S	S	276	S	S
322	Paper manufacturing	282	S	S	S	S	S	S	S	S	656	531	23.6
323	Printing and related support activities	777	S	S	68	S	S	47	1	6057.6	661	1,877	-64.8
324	Petroleum and coal products manufacturing	20,943	21,893	-4.3	86,471	57,493	50.4	10,033	13,222	-24.1	89	129	-31.0
325	Chemical manufacturing	158,997	123,124	29.1	86,334	52,031	65.9	29,461	23,662	24.5	847	1,004	-15.6
326	Plastics and rubber products manufacturing	1,851	1,741	6.3	479	436	9.7	254	313	-18.8	430	947	-54.6
327	Nonmetallic mineral product manufacturing	691	350	97.8	4,927	2,649	86.0	S	127	S	S	S	S
331	Primary metal manufacturing	711	533	33.4	337	S	S	73	14	423.4	350	638	-45.2
332	Fabricated metal product manufacturing	1,059	S	S	204	S	S	S	S	S	584	S	S
333	Machinery manufacturing	1,158	S	S	128	S	S	112	S	S	876	758	15.5
334	Computer and electronic product manufacturing	S	1,373	S	9	S	S	7	S	S	1,240	1,611	-23.0
335	Electrical equipment, appliance, and component manufacturing	668	44	1417.4	48	1	5875.6	44	1	5616.7	825	1,049	-21.4
336	Transportation equipment manufacturing	1,002	S	S	S	Z	S	S	Z	S	S	1,708	S
337	Furniture and related product manufacturing	S	S	S	S	S	S	S	S	S	927	S	S
339	Miscellaneous manufacturing	1,712	2,738	-37.5	32	74	-57.4	31	48	-36.0	1,057	510	107.3
42	Wholesale trade	974,993	810,148	20.3	336,576	273,843	22.9	75,712	57,502	31.7	140	146	-4.2
423	Merchant wholesalers, durable goods	19,881	9,775	103.4	6,850	1,845	271.3	977	559	74.8	231	434	-46.9
4231	Motor vehicle and motor vehicle parts and supplies merchant wholesalers	1,410	S	S	S	S	S	S	S	S	110	S	S
4232	Furniture and home furnishing merchant wholesalers	16	S	S	S	S	S	S	S	S	S	482	S
4233	Lumber and other construction materials merchant wholesalers	450	286	57.5	3,350	536	525.5	67	S	S	38	166	-77.0
4234	Professional and commercial equipment and supplies merchant wholesalers	14,838	7,728	92.0	984	885	11.2	533	440	21.1	273	448	-39.0
4235	Metal and mineral (except petroleum) merchant wholesalers	6	85	-92.9	1	49	-98.3	Z	7	-96.0	517	S	S
4236	Electrical and electronic goods merchant wholesalers	S	S	S	S	S	S	S	S	S	1,590	224	608.8
4237	Hardware, plumbing and heating equipment and supplies merchant wholesalers	348	S	S	210	S	S	S	S	S	S	S	S
4238	Machinery, equipment, and supplies merchant wholesalers	1,778	609	192.0	769	S	S	85	S	S	89	S	S
4239	Miscellaneous durable goods merchant wholesalers	1,009	S	S	661	S	S	S	S	S	428	S	S
424	Merchant wholesalers, nondurable goods	955,112	800,372	19.3	329,726	271,998	21.2	74,735	56,943	31.2	135	126	7.5
4241	Paper and paper product merchant wholesalers	1,113	639	74.1	S	151	S	S	11	S	482	S	S
4242	Drugs and druggists' sundries merchant wholesalers	234,413	196,611	19.2	1,380	1,350	2.2	537	517	3.8	299	311	-3.9

See footnotes at end of table.

Table T7b.

Shipment Characteristics of Temperature Controlled[1] Shipments by NAICS[2] for the United States: 2017 and 2012—Con.

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

NAICS code	NAICS description	Value			Tons			Ton-miles[3]			Average miles per shipment		
		2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
4243	Apparel, piece goods, and notions merchant wholesalers	377	S	S	212	S	S	177	S	S	1,069	S	S
4244	Grocery and related product merchant wholesalers	614,248	480,846	27.7	234,659	203,478	15.3	59,784	45,874	30.3	117	102	15.2
4245	Farm product raw material merchant wholesalers	S	1,697	S	5,199	2,958	75.8	1,393	344	304.4	S	319	S
4246	Chemical and allied products merchant wholesalers	9,626	2,270	324.0	27,006	3,790	612.5	4,194	856	390.1	83	S	S
4247	Petroleum and petroleum products merchant wholesalers	11,415	18,120	-37.0	35,507	37,153	-4.4	S	2,546	S	51	50	2.4
4248	Beer, wine, and distilled alcoholic beverage merchant wholesalers	25,040	14,283	75.3	8,642	5,296	63.2	592	494	19.8	109	66	64.7
4249	Miscellaneous nondurable goods merchant wholesalers	47,821	85,906	-44.3	16,822	17,822	-5.6	3,337	6,301	-47.0	278	276	0.8
4541	Electronic shopping and mail-order houses	45,207	27,088	66.9	667	1,450	-54.0	264	185	43.2	748	375	99.3
45431	Fuel dealers	1,125	1,060	6.2	1,689	975	73.3	37	22	70.4	19	20	-8.9
4931[4]	Warehousing and storage	209,894	162,927	28.8	66,622	55,327	20.4	10,602	8,437	25.7	231	306	-24.6
5111	Newspaper, periodical, book, and directory publishers	S	S	S	S	S	S	S	S	S	S	S	S
551114	Corporate, subsidiary, and regional managing offices	33,712	49,470	-31.9	10,369	17,259	-39.9	3,024	2,597	16.4	743	369	101.1

S Withheld because estimate did not meet publication standards.
Z Rounds to zero.
[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.
[2] NAICS codes shown are those covered in the Commodity Flow Survey.
[3] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[4] For tabulation and publication purposes, NAICS 484 is grouped with NAICS 4931.
Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table T8.

Shipment Characteristics of Temperature Controlled[1] Shipments by Origin State: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Origin state	Value (million dollars)	Tons (thousands)	Ton-miles[2] (millions)	Average miles per shipment
Total	**1,922,133**	**804,713**	**237,806**	**255**
Alabama	28,649	15,113	3,173	169
Alaska	5,086	1,539	1,301	1,875
Arizona	19,889	10,974	3,896	274
Arkansas	20,277	9,266	4,004	178
California	231,608	67,375	26,054	369
Colorado	29,677	16,465	4,310	175
Connecticut	16,531	5,971	901	253
Delaware	10,322	S	665	112
District of Columbia	381	57	S	S
Florida	77,705	30,653	8,793	168
Georgia	56,053	23,467	5,454	162
Hawaii	4,338	1,135	112	273
Idaho	10,513	8,899	6,696	S
Illinois	110,449	47,464	12,339	194
Indiana	39,529	17,471	4,341	180
Iowa	32,038	21,731	8,430	278
Kansas	27,855	7,755	3,604	362
Kentucky	20,770	12,263	2,816	217
Louisiana	22,524	22,984	9,125	103
Maine	5,851	1,805	378	187
Maryland	28,583	17,739	4,212	103
Massachusetts	53,194	17,788	2,704	93
Michigan	43,044	15,861	3,291	146
Minnesota	43,337	31,954	7,361	110
Mississippi	28,816	13,361	5,697	356
Missouri	46,765	13,684	3,492	127
Montana	1,173	955	604	199
Nebraska	33,355	10,674	4,287	243
Nevada	6,278	2,415	182	27
New Hampshire	4,316	1,094	301	138
New Jersey	67,841	21,900	5,014	239
New Mexico	8,701	3,435	819	154
New York	95,541	37,984	11,381	88
North Carolina	66,606	17,811	4,359	302
North Dakota	3,892	2,118	1,409	171
Ohio	57,672	24,941	5,994	150
Oklahoma	17,355	13,594	4,053	142
Oregon	21,092	9,517	3,129	1,190
Pennsylvania	92,067	31,616	5,724	179
Rhode Island	12,569	736	93	S
South Carolina	17,212	7,312	2,096	117
South Dakota	3,191	1,676	1,411	241
Tennessee	46,709	16,722	2,987	688
Texas	163,149	79,424	20,808	175
Utah	21,995	8,966	3,916	232
Vermont	4,755	2,219	760	126
Virginia	40,711	13,218	3,144	113
Washington	51,458	27,390	10,973	179
West Virginia	9,286	3,551	689	170
Wisconsin	59,469	24,237	9,571	227
Wyoming	1,955	2,443	S	552

S Withheld because estimate did not meet publication standards.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The “Reliability of Estimates” tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table T9.

Shipment Characteristics of Temperature Controlled[1] Shipments by Destination State: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Destination state	Value (million dollars)	Tons (thousands)	Ton-miles[2] (millions)	Average miles per shipment
Total	**1,922,133**	**804,713**	**237,806**	**255**
Alabama	27,129	13,918	2,626	264
Alaska	6,054	1,645	1,565	1,496
Arizona	24,942	12,017	4,807	522
Arkansas	18,359	9,846	2,443	348
California	192,081	67,263	27,182	258
Colorado	26,940	16,195	3,365	332
Connecticut	22,860	7,179	1,528	185
Delaware	8,799	S	376	242
District of Columbia	S	1,160	97	144
Florida	92,752	35,740	13,864	270
Georgia	68,295	28,133	10,291	318
Hawaii	7,010	1,370	761	298
Idaho	9,815	6,946	2,136	383
Illinois	101,623	42,268	12,250	168
Indiana	45,422	17,101	3,456	291
Iowa	24,409	15,961	3,452	257
Kansas	18,549	6,982	2,075	242
Kentucky	28,890	10,478	2,564	294
Louisiana	25,915	18,437	3,528	278
Maine	8,507	3,707	1,246	310
Maryland	34,593	12,729	3,286	196
Massachusetts	49,906	14,520	4,048	195
Michigan	51,659	18,830	6,464	246
Minnesota	38,500	25,823	4,696	185
Mississippi	17,621	9,228	1,853	339
Missouri	40,199	20,613	4,586	266
Montana	5,448	2,387	1,578	644
Nebraska	18,214	9,176	2,496	187
Nevada	14,580	4,980	2,176	321
New Hampshire	7,387	1,949	432	343
New Jersey	62,416	19,864	6,417	228
New Mexico	8,787	3,685	972	350
New York	112,267	39,737	8,652	210
North Carolina	57,870	17,737	4,976	252
North Dakota	4,658	4,548	1,653	315
Ohio	80,093	26,922	8,468	252
Oklahoma	19,445	10,425	2,530	311
Oregon	22,895	10,557	3,909	294
Pennsylvania	91,655	37,386	10,544	252
Rhode Island	3,693	1,422	459	112
South Carolina	24,723	8,703	2,951	314
South Dakota	4,175	2,803	730	392
Tennessee	38,808	17,165	4,548	415
Texas	166,816	85,342	25,849	254
Utah	20,584	7,802	4,073	487
Vermont	3,607	1,462	272	263
Virginia	44,949	16,405	3,571	229
Washington	49,332	24,602	7,557	198
West Virginia	5,391	3,727	592	242
Wisconsin	52,092	20,689	7,075	222
Wyoming	3,766	1,707	783	428

S Withheld because estimate did not meet publication standards.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Exports Series

Table E1a.

Export Shipment Characteristics by Export Mode of Transportation: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Export mode of transportation	Value		Tons		Ton-miles	
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total
All modes	**1,074,356**	**100.0**	**582,574**	**100.0**	**283,594**	**100.0**
Truck[1]	209,690	19.5	71,866	12.3	44,508	15.7
For-hire truck	194,513	18.1	64,406	11.1	42,109	14.8
Company-owned truck	15,177	1.4	7,460	1.3	2,399	0.8
Rail	35,694	3.3	76,324	13.1	74,677	26.3
Water	369,335	34.4	427,625	73.4	157,532	55.5
Air (included truck and air)	337,379	31.4	5,880	1.0	6,003	2.1
Pipeline[2]	S	S	S	S	S	S
Parcel, U.S. Postal Service, or courier	122,257	11.4	878	0.2	874	0.3

S Withheld because estimate did not meet publication standards.

[1] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[2] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table E1b.

Export Shipment Characteristics by Export Mode of Transportation: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

Export mode of transportation	Value			Tons			Ton-miles		
	2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change
All modes	**1,074,356**	**1,124,679**	**–4.5**	**582,574**	**564,520**	**3.2**	**283,594**	**274,934**	**3.1**
Truck[1]	209,690	231,178	–9.3	71,866	69,570	3.3	44,508	56,127	–20.7
For-hire truck	194,513	185,667	4.8	64,406	49,290	30.7	42,109	46,507	–9.5
Company-owned truck	15,177	45,511	–66.7	7,460	20,280	–63.2	2,399	9,619	–75.1
Rail	35,694	47,673	–25.1	76,324	57,762	32.1	74,677	51,900	43.9
Water	369,335	456,323	–19.1	427,625	429,781	–0.5	157,532	160,593	–1.9
Air (included truck and air)	337,379	366,820	–8.0	5,880	3,729	57.7	6,003	3,976	51.0
Pipeline[2]	S	S	S	S	S	S	S	S	S
Parcel, U.S. Postal Service, or courier	122,257	20,013	510.9	878	201	337.9	874	273	219.8

S Withheld because estimate did not meet publication standards.

[1] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[2] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table E2a.

Export Shipment Characteristics by Domestic Mode of Transportation: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Domestic mode of transportation	Value		Tons		Ton-miles[1]	
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total
All modes	**1,074,356**	**100.0**	**582,574**	**100.0**	**283,594**	**100.0**
Single modes	**654,863**	**61.0**	**346,001**	**59.4**	**149,931**	**52.9**
Truck[2]	209,473	19.5	71,870	12.3	44,506	15.7
For-hire truck	199,414	18.6	65,509	11.2	43,944	15.5
Company-owned truck	10,059	0.9	6,361	1.1	562	0.2
Rail	31,171	2.9	72,431	12.4	69,037	24.3
Water	76,578	7.1	195,818	33.6	30,383	10.7
Inland water	S	S	S	S	S	S
Great Lakes	S	S	S	S	S	S
Deep sea	71,610	6.7	176,748	30.3	19,954	7.0
Multiple waterways	4,961	0.5	18,605	3.2	10,355	3.7
Air (includes truck and air)	337,641	31.4	5,882	1.0	6,006	2.1
Pipeline[3]	S	S	S	S	S	S
Multiple modes	**419,493**	**39.0**	**236,574**	**40.6**	**133,662**	**47.1**
Parcel, U.S. Postal Service, or courier	122,247	11.4	878	0.2	874	0.3
Truck and rail	4,523	0.4	3,893	0.7	5,641	2.0
Truck and water	232,981	21.7	101,044	17.3	38,957	13.7
Rail and water	42,335	3.9	122,584	21.0	78,787	27.8
Other multiple modes	17,408	1.6	8,175	1.4	9,404	3.3

S Withheld because estimate did not meet publication standards.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[2] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[3] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table E2b.

Export Shipment Characteristics by Domestic Mode of Transportation: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

Domestic mode of transportation	Value			Tons			Ton-miles[1]		
	2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change
All modes	**1,074,356**	**1,124,679**	**–4.5**	**582,574**	**564,520**	**3.2**	**283,594**	**274,934**	**3.1**
Single modes	**654,863**	**922,158**	**–29.0**	**346,001**	**510,502**	**–32.2**	**149,931**	**244,601**	**–38.7**
Truck[2]	209,473	519,776	–59.7	71,870	207,139	–65.3	44,506	100,956	–55.9
For-hire truck	199,414	463,217	–57.0	65,509	154,541	–57.6	43,944	94,889	–53.7
Company-owned truck	10,059	56,559	–82.2	6,361	52,597	–87.9	562	6,068	–90.7
Rail	31,171	74,901	–58.4	72,431	169,631	–57.3	69,037	114,698	–39.8
Water	76,578	63,699	20.2	195,818	123,554	58.5	30,383	23,289	30.5
Inland water	S	S	S	S	S	S	S	S	S
Great Lakes	S	185	S	S	5,142	S	S	S	S
Deep sea	71,610	33,241	115.4	176,748	54,905	221.9	19,954	1,205	1555.8
Multiple waterways	4,961	7,155	–30.7	18,605	15,678	18.7	10,355	14,913	–30.6
Air (includes truck and air)	337,641	258,179	30.8	5,882	3,261	80.4	6,006	3,482	72.5
Pipeline[3]	S	5,603	S	S	6,917	S	S	S	S
Multiple modes	**419,493**	**202,521**	**107.1**	**236,574**	**54,018**	**338.0**	**133,662**	**30,333**	**340.7**
Parcel, U.S. Postal Service, or courier	122,247	131,438	–7.0	878	692	26.9	874	782	11.7
Truck and rail	4,523	61,729	–92.7	3,893	41,846	–90.7	5,641	21,763	–74.1
Truck and water	232,981	7,834	2873.8	101,044	2,416	4082.3	38,957	2,447	1491.8
Rail and water	42,335	1,192	3452.6	122,584	S	S	78,787	S	S
Other multiple modes	17,408	328	5205.3	8,175	2,414	238.6	9,404	1,666	464.3

S Withheld because estimate did not meet publication standards.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[2] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[3] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table E3.

Export Shipment Characteristics by Domestic Mode Share: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Domestic mode to Port of Exit (POE)[1]	Value		Tons		Ton-miles[2]	
	2017 (million dollars)	Percent of export mode total	2017 (thousands)	Percent of export mode total	2017 (millions)	Percent of export mode total
Water export mode total	**369,335**	**100.0**	**427,625**	**100.0**	**157,532**	**100.0**
Truck[3]	226,639	61.4	96,199	22.5	36,540	23.2
Rail	41,881	11.3	116,364	27.2	71,134	45.2
Truck and rail	17,395	4.7	8,141	1.9	9,370	5.9
Water	52,776	14.3	151,025	35.3	27,290	17.3
Truck and water	6,387	1.7	4,859	1.1	2,418	1.5
Rail and water	S	S	6,220	1.5	S	S
Air export mode total	**337,379**	**100.0**	**5,880**	**100.0**	**6,003**	**100.0**
Truck	154,034	45.7	2,624	44.6	1,350	22.5
Air (including truck and air)	135,960	40.3	3,202	54.5	4,645	77.4
Rail export mode total	**35,694**	**100.0**	**76,324**	**100.0**	**74,677**	**100.0**
Rail	31,207	87.4	72,435	94.9	69,040	92.5
Truck and rail	4,487	12.6	3,889	5.1	5,637	7.5

S Withheld because estimate did not meet publication standards.

[1] Listed under each export mode total row are the domestic modes used for transportation to the Port of Exit (POE).

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table E4a.

Export Shipment Characteristics by Country of Destination: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Country of destination	Value		Tons	
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total
Total	**1,074,356**	**100.0**	**582,574**	**100.0**
Canada	207,365	19.3	102,392	17.6
Mexico	114,716	10.7	99,978	17.2
Rest of Americas	115,289	10.7	80,789	13.9
Europe and Africa	246,554	22.9	87,413	15.0
Asia and Oceania	390,432	36.3	212,003	36.4

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table E4b.

Export Shipment Characteristics by Country of Destination: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

Country of destination	Value			Tons		
	2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change
Total	**1,074,356**	**1,124,679**	**–4.5**	**582,574**	**564,520**	**3.2**
Canada	207,365	227,601	–8.9	102,392	88,722	15.4
Mexico	114,716	110,230	4.1	99,978	78,335	27.6
All other countries	752,275	786,848	–4.4	380,204	397,463	–4.3

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table E5a.

Export Shipment Characteristics by Export Mode of Transportation and Country of Destination: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Export mode of transportation and country of destination	Value		Tons	
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total
Total	**1,074,356**	**100.0**	**582,574**	**100.0**
CANADA				
All modes	**207,365**	**100.0**	**102,392**	**100.0**
Truck[1]	138,318	66.7	46,480	45.4
For-hire truck	131,270	63.3	41,769	40.8
Company-owned truck	7,048	3.4	4,711	4.6
Rail	22,745	11.0	39,416	38.5
Water	2,729	1.3	15,082	14.7
Air (included truck and air)	18,529	8.9	1,130	1.1
Pipeline[2]	S	S	S	S
Parcel, U.S. Postal Service, or courier	25,044	12.1	284	0.3
MEXICO				
All modes	**114,716**	**100.0**	**99,978**	**100.0**
Truck[1]	71,373	62.2	25,387	25.4
For-hire truck	63,243	55.1	22,638	22.6
Company-owned truck	8,130	7.1	2,749	2.7
Rail	12,949	11.3	36,908	36.9
Water	16,002	13.9	36,890	36.9
Air (included truck and air)	8,785	7.7	750	0.8
Pipeline[2]	S	S	S	S
Parcel, U.S. Postal Service, or courier	5,609	4.9	43	Z
REST OF AMERICAS				
All modes	**115,289**	**100.0**	**80,789**	**100.0**
Water	74,443	64.6	79,840	98.8
Air (included truck and air)	30,711	26.6	868	1.1
Parcel, U.S. Postal Service, or courier	10,135	8.8	81	0.1
EUROPE AND AFRICA				
All modes	**246,554**	**100.0**	**87,413**	**100.0**
Water	101,684	41.2	86,063	98.5
Air (included truck and air)	113,371	46.0	1,217	1.4
Parcel, U.S. Postal Service, or courier	31,499	12.8	133	0.2
ASIA AND OCEANIA				
All modes	**390,432**	**100.0**	**212,003**	**100.0**
Water	174,477	44.7	209,750	98.9
Air (included truck and air)	165,983	42.5	1,915	0.9
Parcel, U.S. Postal Service, or courier	49,972	12.8	338	0.2

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[2] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table E5b.

Export Shipment Characteristics by Export Mode of Transportation and Country of Destination: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

Export mode of transportation and country of destination	Value			Tons		
	2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change
Total	**1,074,356**	**1,124,679**	**–4.5**	**582,574**	**564,520**	**3.2**
CANADA						
All modes	**207,365**	**227,601**	**–8.9**	**102,392**	**88,722**	**15.4**
Truck[1]	138,318	165,581	–16.5	46,480	47,237	–1.6
For-hire truck	131,270	131,658	–0.3	41,769	35,870	16.4
Company-owned truck	7,048	33,923	–79.2	4,711	11,367	–58.6
Rail	22,745	28,692	–20.7	39,416	27,095	45.5
Water	2,729	3,858	–29.3	15,082	14,028	7.5
Air (included truck and air)	18,529	13,291	39.4	1,130	172	556.7
Pipeline[2]	S	S	S	S	S	S
Parcel, U.S. Postal Service, or courier	25,044	16,162	55.0	284	174	62.7
MEXICO						
All modes	**114,716**	**110,230**	**4.1**	**99,978**	**78,335**	**27.6**
Truck[1]	71,373	65,597	8.8	25,387	22,333	13.7
For-hire truck	63,243	54,008	17.1	22,638	13,420	68.7
Company-owned truck	8,130	11,588	–29.8	2,749	8,913	–69.2
Rail	12,949	18,980	–31.8	36,908	30,667	20.4
Water	16,002	13,528	18.3	36,890	21,778	69.4
Air (included truck and air)	8,785	5,617	56.4	750	70	975.5
Pipeline[2]	S	S	S	S	S	S
Parcel, U.S. Postal Service, or courier	5,609	3,851	45.6	43	26	64.2
ALL OTHER COUNTRIES						
All modes	**752,275**	**786,848**	**–4.4**	**380,204**	**397,463**	**–4.3**
Water	350,604	438,937	–20.1	375,653	393,976	–4.7
Air (included truck and air)	310,065	347,911	–10.9	4,000	3,487	14.7
Parcel, U.S. Postal Service, or courier	91,605	S	S	551	S	S

S Withheld because estimate did not meet publication standards.

[1] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[2] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table E6a.

Export Shipment Characteristics by Two-Digit Commodity: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value		Tons		Ton-miles	
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total
	All commodities[1]	**1,074,356**	**100.0**	**582,574**	**100.0**	**283,594**	**100.0**
01	Live animals and live fish	174	Z	44	Z	46	Z
02	Cereal grains (includes seed)	15,090	1.4	88,880	15.3	34,894	12.3
03	Agricultural products (excludes animal feed, cereal grains, and forage products)	26,859	2.5	42,628	7.3	22,593	8.0
04	Animal feed, eggs, honey, and other products of animal origin	7,380	0.7	10,650	1.8	7,564	2.7
05	Meat, poultry, fish, seafood, and their preparations	13,540	1.3	5,104	0.9	4,012	1.4
06	Milled grain products and preparations and bakery products	4,252	0.4	4,967	0.9	3,954	1.4
07	Other prepared foodstuffs and fats and oils	13,799	1.3	12,453	2.1	10,828	3.8
08	Alcoholic beverages, and denatured alcohol	4,453	0.4	2,380	0.4	1,350	0.5
09	Tobacco products	1,046	0.1	80	Z	S	S
10	Monumental or building stone	133	Z	135	Z	61	Z
11	Natural sands	548	0.1	10,775	1.8	4,860	1.7
12	Gravel and crushed stone (excludes dolomite and slate)	81	Z	2,024	0.3	719	0.3
13	Other nonmetallic minerals, n.e.c.	1,878	0.2	8,754	1.5	5,287	1.9
14	Metallic ores and concentrates	11,217	1.0	16,971	2.9	13,198	4.7
15	Coal	6,293	0.6	87,867	15.1	57,473	20.3
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	11,376	1.1	21,646	3.7	2,428	0.9
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	22,122	2.1	34,358	5.9	3,051	1.1
19	Other coal and petroleum products, n.e.c.	8,276	0.8	20,269	3.5	4,594	1.6
20	Basic chemicals	36,252	3.4	25,822	4.4	14,280	5.0
21	Pharmaceutical products	52,882	4.9	1,023	0.2	739	0.3
22	Fertilizers	2,646	0.2	8,682	1.5	4,516	1.6
23	Chemical products and preparations, n.e.c.	43,278	4.0	11,760	2.0	6,848	2.4
24	Plastics and rubber	44,184	4.1	17,144	2.9	11,771	4.2
25	Logs and other wood in the rough	830	0.1	2,445	0.4	1,156	0.4
26	Wood products	6,291	0.6	12,171	2.1	6,166	2.2
27	Pulp, newsprint, paper, and paperboard	9,679	0.9	12,830	2.2	6,823	2.4
28	Paper or paperboard articles	3,215	0.3	3,382	0.6	1,233	0.4
29	Printed products	3,706	0.3	515	0.1	263	0.1
30	Textiles, leather, and articles of textiles or leather	22,404	2.1	3,463	0.6	2,562	0.9
31	Nonmetallic mineral products	8,941	0.8	9,119	1.6	4,410	1.6
32	Base metal in primary or semifinished forms and in finished basic shapes	27,936	2.6	13,815	2.4	8,844	3.1
33	Articles of base metal	20,834	1.9	6,693	1.1	3,892	1.4
34	Machinery	102,872	9.6	7,180	1.2	6,294	2.2
35	Electronic and other electrical equipment and components and office equipment	167,526	15.6	4,211	0.7	3,181	1.1
36	Motorized and other vehicles (including parts)	120,298	11.2	13,338	2.3	10,223	3.6
37	Transportation equipment, n.e.c.	100,648	9.4	619	0.1	692	0.2
38	Precision instruments and apparatus	64,774	6.0	1,173	0.2	1,214	0.4
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	6,436	0.6	792	0.1	475	0.2
40	Miscellaneous manufactured products	50,335	4.7	2,484	0.4	2,155	0.8
41	Waste and scrap	18,548	1.7	50,027	8.6	7,833	2.8
43	Mixed freight	11,323	1.1	3,900	0.7	1,055	0.4
99	Commodity unkown	X	X	X	X	S	S

S Withheld because estimate did not meet publication standards.
X Not applicable.
Z Rounds to zero.
[1] Estimates exclude shipments of crude petroleum (SCTG 16).
Note: Value-of-shipments estimates have not been adjusted for price changes. The “Reliability of Estimates” tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table E6b.

Export Shipment Characteristics by Two-Digit Commodity: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value			Tons			Ton-miles		
		2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change
	All commodities[1]	**1,074,356**	**1,124,679**	**–4.5**	**582,574**	**564,520**	**3.2**	**283,594**	**274,934**	**3.1**
01	Live animals and live fish	174	56	210.4	44	S	S	46	S	S
02	Cereal grains (includes seed)	15,090	17,481	–13.7	88,880	61,495	44.5	34,894	20,184	72.9
03	Agricultural products (excludes animal feed, cereal grains, and forage products)	26,859	35,411	–24.2	42,628	40,820	4.4	22,593	30,556	–26.1
04	Animal feed, eggs, honey, and other products of animal origin	7,380	8,249	–10.5	10,650	10,496	1.5	7,564	8,032	–5.8
05	Meat, poultry, fish, seafood, and their preparations	13,540	15,511	–12.7	5,104	6,151	–17.0	4,012	5,858	–31.5
06	Milled grain products and preparations and bakery products	4,252	5,319	–20.1	4,967	5,125	–3.1	3,954	4,065	–2.7
07	Other prepared foodstuffs and fats and oils	13,799	21,475	–35.7	12,453	17,174	–27.5	10,828	16,298	–33.6
08	Alcoholic beverages, and denatured alcohol	4,453	3,818	16.6	2,380	1,423	67.2	1,350	1,126	19.9
09	Tobacco products	1,046	439	138.4	80	39	107.1	S	38	S
10	Monumental or building stone	133	81	63.6	135	172	–21.2	61	167	–63.4
11	Natural sands	548	496	10.6	10,775	2,828	281.0	4,860	2,579	88.4
12	Gravel and crushed stone (excludes dolomite and slate)	81	39	105.0	2,024	S	S	719	S	S
13	Other nonmetallic minerals, n.e.c.	1,878	1,516	23.9	8,754	5,813	50.6	5,287	3,391	55.9
14	Metallic ores and concentrates	11,217	9,414	19.2	16,971	20,767	–18.3	13,198	11,549	14.3
15	Coal	6,293	4,140	52.0	87,867	62,808	39.9	57,473	48,028	19.7
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	11,376	15,370	–26.0	21,646	17,448	24.1	2,428	S	S
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	22,122	32,625	–32.2	34,358	41,164	–16.5	3,051	S	S
19	Other coal and petroleum products, n.e.c.	8,276	18,033	–54.1	20,269	54,017	–62.5	4,594	7,080	–35.1
20	Basic chemicals	36,252	32,751	10.7	25,822	15,170	70.2	14,280	9,351	52.7
21	Pharmaceutical products	52,882	42,511	24.4	1,023	492	108.1	739	427	73.1
22	Fertilizers	2,646	S	S	8,682	S	S	4,516	3,164	42.7
23	Chemical products and preparations, n.e.c.	43,278	33,071	30.9	11,760	6,621	77.6	6,848	4,820	42.1
24	Plastics and rubber	44,184	51,671	–14.5	17,144	16,687	2.7	11,771	10,459	12.5
25	Logs and other wood in the rough	830	S	S	2,445	1,280	90.9	1,156	258	348.1
26	Wood products	6,291	4,771	31.9	12,171	8,215	48.2	6,166	4,743	30.0
27	Pulp, newsprint, paper, and paperboard	9,679	14,339	–32.5	12,830	17,455	–26.5	6,823	9,402	–27.4
28	Paper or paperboard articles	3,215	3,695	–13.0	3,382	3,317	2.0	1,233	1,640	–24.8
29	Printed products	3,706	4,573	–18.9	515	S	S	263	528	–50.1
30	Textiles, leather, and articles of textiles or leather	22,404	25,755	–13.0	3,463	4,036	–14.2	2,562	3,285	–22.0
31	Nonmetallic mineral products	8,941	8,893	0.5	9,119	8,476	7.6	4,410	5,596	–21.2
32	Base metal in primary or semifinished forms and in finished basic shapes	27,936	26,937	3.7	13,815	12,490	10.6	8,844	10,008	–11.6
33	Articles of base metal	20,834	22,121	–5.8	6,693	5,189	29.0	3,892	3,767	3.3
34	Machinery	102,872	110,099	–6.6	7,180	6,783	5.9	6,294	6,463	–2.6
35	Electronic and other electrical equipment and components and office equipment	167,526	185,416	–9.6	4,211	3,039	38.6	3,181	2,743	15.9
36	Motorized and other vehicles (including parts)	120,298	130,581	–7.9	13,338	14,244	–6.4	10,223	12,313	–17.0
37	Transportation equipment, n.e.c.	100,648	59,904	68.0	619	659	–6.0	692	576	20.0
38	Precision instruments and apparatus	64,774	69,555	–6.9	1,173	899	30.4	1,214	840	44.6
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	6,436	4,817	33.6	792	541	46.3	475	484	–1.8
40	Miscellaneous manufactured products	50,335	45,628	10.3	2,484	2,840	–12.5	2,155	2,685	–19.7
41	Waste and scrap	18,548	37,097	–50.0	50,027	66,449	–24.7	7,833	15,694	–50.1
43	Mixed freight	11,323	15,855	–28.6	3,900	3,649	6.9	1,055	1,949	–45.8
99	Commodity unknown	X	0	X	X	0	X	S	S	S

S Withheld because estimate did not meet publication standards.

X Not applicable.

[1] Estimates exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The “Reliability of Estimates” tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table E7.

Export Shipment Characteristics by NAICS[1]: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

NAICS code	NAICS description	Value (million dollars)	Tons (thousands)	Ton-miles[2] (millions)
	Total	**1,074,356**	**582,574**	**283,594**
212	Mining (except oil and gas)	19,960	121,693	82,211
31–33	Manufacturing	675,397	206,824	111,469
311	Food manufacturing	28,002	24,873	21,152
312	Beverage and tobacco product manufacturing	4,773	2,570	1,561
313	Textile mills	4,622	1,107	1,006
314	Textile product mills	1,528	346	S
315	Apparel manufacturing	725	34	25
316	Leather and allied product manufacturing	808	334	530
321	Wood product manufacturing	4,774	9,758	4,136
322	Paper manufacturing	11,487	11,616	6,898
323	Printing and related support activities	2,162	232	208
324	Petroleum and coal products manufacturing	30,761	52,914	6,659
325	Chemical manufacturing	114,716	56,157	34,290
326	Plastics and rubber products manufacturing	18,859	3,199	2,764
327	Nonmetallic mineral product manufacturing	8,179	6,947	4,539
331	Primary metal manufacturing	19,255	8,644	6,303
332	Fabricated metal product manufacturing	26,182	7,042	4,070
333	Machinery manufacturing	64,299	7,473	5,242
334	Computer and electronic product manufacturing	106,739	1,307	1,126
335	Electrical equipment, appliance, and component manufacturing	15,087	1,345	1,235
336	Transportation equipment manufacturing	189,251	9,564	7,956
337	Furniture and related product manufacturing	1,711	478	436
339	Miscellaneous manufacturing	21,475	885	974
42	Wholesale trade	322,271	241,422	87,433
423	Merchant wholesalers, durable goods	224,241	78,953	22,765
4231	Motor vehicle and motor vehicle parts and supplies merchant wholesalers	32,516	4,847	2,502
4232	Furniture and home furnishing merchant wholesalers	3,482	S	175
4233	Lumber and other construction materials merchant wholesalers	2,980	3,749	S
4234	Professional and commercial equipment and supplies merchant wholesalers	43,576	1,792	917
4235	Metal and mineral (except petroleum) merchant wholesalers	6,823	8,209	2,709
4236	Electrical and electronic goods merchant wholesalers	59,994	1,214	1,509
4237	Hardware, plumbing and heating equipment and supplies merchant wholesalers	3,163	364	255
4238	Machinery, equipment, and supplies merchant wholesalers	32,688	2,004	1,638
4239	Miscellaneous durable goods merchant wholesalers	39,019	56,200	10,061
424	Merchant wholesalers, nondurable goods	98,030	162,469	64,668
4241	Paper and paper product merchant wholesalers	2,397	2,256	420
4242	Drugs and druggists' sundries merchant wholesalers	11,468	317	180
4243	Apparel, piece goods, and notions merchant wholesalers	5,967	795	448
4244	Grocery and related product merchant wholesalers	13,616	6,069	4,492
4245	Farm product raw material merchant wholesalers	35,121	125,304	49,785
4246	Chemical and allied products merchant wholesalers	9,767	5,537	3,082
4247	Petroleum and petroleum products merchant wholesalers	S	S	S
4248	Beer, wine, and distilled alcoholic beverage merchant wholesalers	508	114	60
4249	Miscellaneous nondurable goods merchant wholesalers	8,643	7,258	4,346
4541	Electronic shopping and mail-order houses	23,302	585	355
45431	Fuel dealers	S	S	S
4931[3]	Warehousing and storage	17,455	8,618	1,793
5111	Newspaper, periodical, book, and directory publishers	443	59	56
551114	Corporate, subsidiary, and regional managing offices	15,525	3,368	275

S Withheld because estimate did not meet publication standards.

[1] NAICS codes shown are those covered in the Commodity Flow Survey.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] For tabulation and publication purposes, NAICS 484 is grouped with NAICS 4931.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table E8.

Export Shipment Characteristics by Origin State: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Origin state	Value		Tons	
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total
Total	**1,074,356**	**100.0**	**582,574**	**100.0**
Alabama	19,159	1.8	11,697	2.0
Alaska	S	S	S	S
Arizona	15,157	1.4	1,130	0.2
Arkansas	4,751	0.4	1,420	0.2
California	160,095	14.9	60,840	10.4
Colorado	8,869	0.8	4,513	0.8
Connecticut	21,472	2.0	2,356	0.4
Delaware	3,288	0.3	509	0.1
District of Columbia	S	S	S	S
Florida	47,854	4.5	19,543	3.4
Georgia	20,376	1.9	10,722	1.8
Hawaii	356	Z	S	S
Idaho	3,260	0.3	764	0.1
Illinois	36,534	3.4	11,175	1.9
Indiana	26,016	2.4	7,995	1.4
Iowa	13,092	1.2	7,839	1.3
Kansas	4,642	0.4	3,094	0.5
Kentucky	11,758	1.1	S	S
Louisiana	35,386	3.3	90,790	15.6
Maine	2,677	0.2	716	0.1
Maryland	5,244	0.5	967	0.2
Massachusetts	22,711	2.1	S	S
Michigan	47,246	4.4	10,634	1.8
Minnesota	21,034	2.0	20,016	3.4
Mississippi	8,559	0.8	9,098	1.6
Missouri	11,736	1.1	8,178	1.4
Montana	2,405	0.2	14,097	2.4
Nebrasaka	4,817	0.4	3,451	0.6
Nevada	8,996	0.8	849	0.1
New Hampshire	3,422	0.3	355	0.1
New Jersey	23,773	2.2	8,296	1.4
New Mexico	1,738	0.2	889	0.2
New York	47,024	4.4	8,537	1.5
North Carolina	30,806	2.9	5,123	0.9
North Dakota	1,984	0.2	3,365	0.6
Ohio	34,532	3.2	12,885	2.2
Oklahoma	4,528	0.4	961	0.2
Oregon	20,552	1.9	S	S
Pennsylvania	35,290	3.3	18,864	3.2
Rhode Island	1,700	0.2	155	Z
South Carolina	25,505	2.4	4,132	0.7
South Dakota	1,250	0.1	2,449	0.4
Tennessee	21,695	2.0	4,856	0.8
Texas	120,552	11.2	100,925	17.3
Utah	8,862	0.8	1,197	0.2
Vermont	1,515	0.1	1,333	0.2
Virginia	13,994	1.3	20,841	3.6
Washington	75,003	7.0	19,458	3.3
West Virginia	5,419	0.5	26,224	4.5
Wisconsin	23,262	2.2	13,855	2.4
Wyoming	528	Z	2,498	0.4

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

Note: Value-of-shipments estimates have not been adjusted for price changes. The “Reliability of Estimates” tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Hazardous Materials Series

Table H1a.

Hazardous Material Shipment Characteristics by Mode of Transportation for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Mode of transportation	Value		Tons		Ton-miles[1]		Average miles per shipment
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
All modes	**1,680,231**	**100.0**	**2,967,965**	**100.0**	**382,472**	**100.0**	**189**
Single modes	**1,612,129**	**95.9**	**2,889,521**	**97.4**	**307,204**	**80.3**	**72**
Truck[2]	1,091,250	64.9	1,814,848	61.1	126,800	33.2	63
For-hire truck	567,599	33.8	932,658	31.4	92,146	24.1	153
Company-owned truck	523,651	31.2	882,190	29.7	34,655	9.1	28
Rail	39,040	2.3	90,387	3.0	61,669	16.1	640
Water	137,109	8.2	304,189	10.2	60,934	15.9	72
Inland water	72,179	4.3	171,346	5.8	29,043	7.6	48
Great Lakes	S	S	S	S	S	S	S
Deep sea	63,134	3.8	128,806	4.3	31,547	8.2	257
Multiple waterways	S	S	S	S	345	0.1	S
Air (includes truck and air)	4,817	0.3	251	Z	201	0.1	1,333
Pipeline[3]	339,912	20.2	679,846	22.9	S	S	S
Multiple modes	**68,101**	**4.1**	**78,444**	**2.6**	**75,268**	**19.7**	**947**
Parcel, U.S. Postal Service, or courier	13,475	0.8	345	Z	236	0.1	949
Truck and rail	35,697	2.1	70,185	2.4	70,337	18.4	1,003
Truck and water	16,504	1.0	6,167	0.2	3,269	0.9	489
Rail and water	1,121	0.1	1,481	Z	1,175	0.3	1,465
Other multiple modes	1,305	0.1	265	Z	253	0.1	1,045
Other modes	**S**	**S**	**S**	**S**	**S**	**S**	**S**

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[2] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[3] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table H1b.

Hazardous Material Shipment Characteristics by Mode of Transportation for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Mode of transportation	Value			Tons			Ton-miles[1]			Average miles per shipment		
	2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
All modes	**1,680,231**	**2,334,425**	**–28.0**	**2,967,965**	**2,580,153**	**15.0**	**382,472**	**307,524**	**24.4**	**189**	**114**	**65.9**
Single modes	**1,612,129**	**2,304,743**	**–30.1**	**2,889,521**	**2,552,868**	**13.2**	**307,204**	**275,628**	**11.5**	**72**	**68**	**6.0**
Truck[2]	1,091,250	1,466,021	–25.6	1,814,848	1,531,405	18.5	126,800	96,559	31.3	63	56	12.1
For-hire truck	567,599	870,893	–34.8	932,658	882,288	5.7	92,146	62,018	48.6	153	150	2.1
Company-owned truck	523,651	595,128	–12.0	882,190	649,117	35.9	34,655	34,541	0.3	28	33	–15.6
Rail	39,040	79,222	–50.7	90,387	110,988	–18.6	61,669	84,850	–27.3	640	808	–20.9
Water	137,109	217,816	–37.1	304,189	283,561	7.3	60,934	54,902	11.0	72	212	–66.1
Inland water	72,179	170,595	–57.7	171,346	226,349	–24.3	29,043	27,636	5.1	48	S	S
Great Lakes	S	S	S	S	S	S	S	S	S	S	S	S
Deep sea	63,134	35,570	77.5	128,806	45,001	186.2	31,547	18,359	71.8	257	854	–69.9
Multiple waterways	S	11,651	S	S	12,210	S	345	8,907	–96.1	S	S	S
Air (includes truck and air)	4,817	4,380	10.0	251	261	–3.9	201	271	–25.6	1,333	1,120	19.1
Pipeline[3]	339,912	537,304	–36.7	679,846	626,652	8.5	S	S	S	S	S	S
Multiple modes	**68,101**	**29,682**	**129.4**	**78,444**	**27,285**	**187.5**	**75,268**	**31,896**	**136.0**	**947**	**654**	**44.9**
Parcel, U.S. Postal Service, or courier	13,475	10,294	30.9	345	305	13.2	236	178	32.5	949	650	46.0
Truck and rail	35,697	13,338	167.6	70,185	16,992	313.0	70,337	16,577	324.3	1,003	954	5.2
Truck and water	16,504	S	S	6,167	S	S	3,269	S	S	489	1,181	–58.6
Rail and water	1,121	2,474	–54.7	1,481	4,589	–67.7	1,175	1,377	–14.7	1,465	S	S
Other multiple modes	1,305	S	S	265	S	S	253	S	S	1,045	S	S
Other modes	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**

S Withheld because estimate did not meet publication standards.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[2] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[3] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table H2a.

Hazardous Material Shipment Characteristics by Hazard Class for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Hazard class and description	Value		Tons		Ton-miles[1]		Average miles per shipment
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
Total	**1,680,231**	**100.0**	**2,967,965**	**100.0**	**382,472**	**100.0**	**189**
Class 1, Explosives	14,936	0.9	3,290	0.1	1,011	0.3	1,046
Class 2, Gases	114,845	6.8	227,616	7.7	28,880	7.6	210
Class 3, Flammable and combustible liquid	1,373,803	81.8	2,466,634	83.1	269,803	70.5	100
Class 4, Flammable solid; spontaneously combustible material; dangerous when wet material	5,308	0.3	28,210	1.0	7,614	2.0	478
Class 5, Oxidizers and organic peroxides	9,753	0.6	14,978	0.5	5,827	1.5	204
Class 6, Toxic materials and infectious substances	13,298	0.8	6,358	0.2	3,838	1.0	828
Class 7, Radioactive material	6,945	0.4	427	Z	42	Z	63
Class 8, Corrosive material	79,322	4.7	151,007	5.1	45,704	11.9	273
Class 9, Miscellaneous hazardous material	62,020	3.7	69,444	2.3	19,753	5.2	944

Z Rounds to zero.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table H2b.

Hazardous Material Shipment Characteristics by Hazard Class for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

Hazard class and description	Value			Tons			Ton-miles[1]			Average miles per shipment		
	2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
Total	**1,680,231**	**2,334,425**	**–28.0**	**2,967,965**	**2,580,153**	**15.0**	**382,472**	**307,524**	**24.4**	**189**	**114**	**65.9**
Class 1, Explosives	14,936	18,397	–18.8	3,290	4,045	–18.7	1,011	1,012	0.0	1,046	840	24.6
Class 2, Gases	114,845	125,054	–8.2	227,616	164,794	38.1	28,880	33,157	–12.9	210	57	266.3
Class 3, Flammable and combustible liquid	1,373,803	2,016,681	–31.9	2,466,634	2,203,490	11.9	269,803	204,573	31.9	100	93	7.2
Class 4, Flammable solid; spontaneously combustible material; dangerous when wet material	5,308	5,415	–2.0	28,210	11,321	149.2	7,614	5,804	31.2	478	565	–15.4
Class 5, Oxidizers and organic peroxides	9,753	7,562	29.0	14,978	12,025	24.6	5,827	5,479	6.3	204	437	–53.3
Class 6, Toxic materials and infectious substances	13,298	15,196	–12.5	6,358	7,612	–16.5	3,838	3,607	6.4	828	513	61.5
Class 7, Radioactive material	6,945	12,288	–43.5	427	S	S	42	39	8.5	63	34	86.5
Class 8, Corrosive material	79,322	75,850	4.6	151,007	125,287	20.5	45,704	37,784	21.0	273	264	3.3
Class 9, Miscellaneous hazardous material	62,020	57,981	7.0	69,444	51,006	36.2	19,753	16,068	22.9	944	530	78.0

S Withheld because estimate did not meet publication standards.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table H3.

Hazardous Material Shipment Characteristics by Hazard Division for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Hazard division and description	Value		Tons		Ton-miles[1]		Average miles per shipment
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
Total	**1,680,231**	**100.0**	**2,967,965**	**100.0**	**382,472**	**100.0**	**189**
Division 1.1, Explosives with a mass explosion hazard	2,043	0.1	2,034	0.1	455	0.1	386
Division 1.2, Explosives with a projection hazard	712	Z	16	Z	S	S	1,387
Division 1.3, Explosives with predominantly a fire hazard	1,878	0.1	52	Z	46	Z	950
Division 1.4, Explosives with no significant blast hazard	8,837	0.5	510	Z	365	0.1	1,099
Division 1.5, Very insensitive explosives, blasting agent	1,467	0.1	678	Z	130	Z	248
Division 1.6, Extremely insensitive explosives, no mass explosion	S	S	S	S	S	S	S
Division 2.1, Flammable gas	78,836	4.7	120,949	4.1	14,928	3.9	26
Division 2.2, Nonflammable, nonpoisonous compressed gas	30,652	1.8	96,838	3.3	11,477	3.0	483
Division 2.3, Gas poisonous by inhalation	5,357	0.3	9,830	0.3	2,475	0.6	200
Division 4.1, Flammable solid	2,318	0.1	24,283	0.8	4,362	1.1	425
Division 4.2, Spontaneously combustible material	1,425	0.1	1,095	Z	265	0.1	355
Division 4.3, Dangerous when wet material	1,566	0.1	2,832	0.1	2,987	0.8	713
Division 5.1, Oxidizer	8,864	0.5	14,840	0.5	5,771	1.5	199
Division 5.2, Organic peroxide	889	0.1	138	Z	56	Z	326
Division 6.1, Toxic (poisonous) materials	12,795	0.8	6,354	0.2	3,833	1.0	831
Division 6.2, Infectious substances	S	S	S	S	S	S	752

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Hazard classes 3, 7, 8, and 9 are not separated into divisions and therefore not applicable to this table.

Table H4.

Hazardous Material Shipment Characteristics for the Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value		Tons		Ton-miles[2]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
	Total	**1,680,231**	**100.0**	**2,967,965**	**100.0**	**382,472**	**100.0**	**189**
	Subtotal for Selected UN/NA Numbers	**1,506,405**	**89.8**	**2,851,016**	**96.4**	**340,665**	**88.9**	**X**
1005	Ammonia, anhydrous	6,666	0.4	19,444	0.7	2,853	0.7	82
1017	Chlorine	2,666	0.2	6,828	0.2	1,470	0.4	204
1046	Helium, compressed	2,234	0.1	1,776	0.1	79	Z	60
1066	Nitrogen, compressed	1,610	0.1	7,397	0.2	137	Z	39
1072	Oxygen, compressed	2,778	0.2	7,678	0.3	S	S	37
1073	Oxygen, refrigerated liquid (cryogenic liquid)	927	0.1	11,083	0.4	1,386	0.4	79
1075	Petroleum gases, liquefied or liquefied petroleum gas	27,783	1.7	45,821	1.5	6,929	1.8	31
1077	Propylene see also petroleum gases, liquefied	2,014	0.1	2,323	0.1	187	Z	89
1086	Vinyl chloride, stabilized	2,738	0.2	6,816	0.2	3,027	0.8	723
1114	Benzene	9,327	0.6	13,388	0.5	S	S	752
1145	Cyclohexane	4,176	0.2	S	S	978	0.3	S
1170	Ethanol or ethyl alcohol or ethanol solutions or ethyl alcohol solutions	13,629	0.8	24,477	0.8	13,623	3.6	675
1202	Diesel fuel, including gas oil or heating oil, light	162,920	9.7	300,407	10.1	33,994	8.9	79
1203	Gasoline includes gasoline mixed with ethyl alcohol, with not more than 10% alcohol	665,113	39.6	1,212,598	40.9	86,948	22.7	44
1219	Isopropanol or isopropyl alcohol	5,354	0.3	1,537	0.1	480	0.1	293
1223	Kerosene	5,088	0.3	10,642	0.4	1,422	0.4	19
1230	Methanol	1,371	0.1	1,867	0.1	271	0.1	378
1263	Paint including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, liquid lacquer base, and paint related material including paint thinning, drying, removing or reducing compound	16,203	1.0	2,785	0.1	1,736	0.5	306
1268	Petroleum distillates, n.o.s. or petroleum products, n.o.s.	24,412	1.5	46,021	1.6	11,206	2.9	144
1270	Petroleum oil	5,624	0.3	6,405	0.2	1,245	0.3	351
1307	Xylenes	3,488	0.2	4,756	0.2	S	S	176
1350	Sulfur	109	Z	1,969	0.1	169	Z	55
1789	Hydrochloric acid	2,381	0.1	17,270	0.6	7,658	2.0	243
1791	Hypochlorite solutions	2,615	0.2	10,848	0.4	1,541	0.4	101
1805	Phosphoric acid solution	2,263	0.1	3,678	0.1	2,238	0.6	387
1814	Potassium hydroxide, solution	2,364	0.1	3,088	0.1	990	0.3	271
1824	Sodium hydroxide solution	10,128	0.6	33,968	1.1	13,161	3.4	289
1830	Sulfuric acid with more than 51% acid	6,251	0.4	37,783	1.3	7,708	2.0	249
1831	Sulfuric acid, fuming	S	S	S	S	S	S	107
1845	Carbon dioxide, solid or dry ice	1,377	0.1	2,902	0.1	362	0.1	214
1863	Fuel, aviation, turbine engine	43,800	2.6	93,361	3.1	8,776	2.3	75
1866	Resin solution, flammable	8,371	0.5	3,013	0.1	1,535	0.4	484
1964	Hydrocarbon gas mixture, compressed, n.o.s.	1,063	0.1	4,985	0.2	419	0.1	S
1977	Nitrogen, refrigerated liquid cryogenic liquid	2,461	0.1	27,563	0.9	2,543	0.7	47
1978	Propane, see also petroleum gases, liquefied	29,048	1.7	39,393	1.3	1,815	0.5	20
1987	Alcohols, n.o.s., including denatured alcohol	16,471	1.0	32,443	1.1	22,603	5.9	390
1993	Flammable liquids, n.o.s., including anti-freeze, liquid, combustible liquid, n.o.s., compounds, cleaning liquid, tree killing, diesel fuel, fuel oil (no. 1, 2, 4, 5, or 6), or plastic solvent, n.o.s.	320,902	19.1	612,103	20.6	50,514	13.2	43

See footnotes at end of table.

Table H4.

Hazardous Material Shipment Characteristics for the Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value		Tons		Ton-miles[2]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
1999	Tars, liquid including road oils and cutback bitumens, including road asphalt	12,468	0.7	47,778	1.6	6,272	1.6	105
2014	Hydrogen peroxide, aqueous solutions with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)	1,343	0.1	1,777	0.1	871	0.2	308
2031	Nitric acid other than red fuming	S	S	S	S	S	S	154
2055	Styrene monomer, stabilized	2,764	0.2	2,513	0.1	2,458	0.6	380
2187	Carbon dioxide, refrigerated liquid	754	Z	10,792	0.4	1,841	0.5	69
2448	Sulfur, molten	1,028	0.1	21,151	0.7	3,932	1.0	206
2672	Ammonia solution, relative density between 0.880 and 0.957 at 15 degrees C in water, with more than 10% but not more than 35% ammonia	1,019	0.1	4,698	0.2	857	0.2	227
2794	Batteries, wet, filled with acid, electric storage	17,394	1.0	4,704	0.2	1,040	0.3	57
3077	Environmentally hazardous substance, solid, n.o.s., including hazardous waste, solid, n.o.s. or other regulated substances, solid, n.o.s.	8,610	0.5	3,656	0.1	3,520	0.9	835
3082	Environmentally hazardous substance, liquid, n.o.s., including hazardous waste, liquid, n.o.s., marine pollutants, liquid or solid, n.o.s., or other regulated substances, liquid, n.o.s.	17,164	1.0	12,160	0.4	7,375	1.9	371
3257	Elevated temperature liquid, n.o.s., at or above 100 C and below its flash point (including molten metals, molten salts, etc.)	16,223	1.0	47,590	1.6	7,203	1.9	129
3264	Corrosive liquid, acidic, inorganic, n.o.s.	1,525	0.1	2,285	0.1	455	0.1	458
3475	Ethanol and gasoline mixture or ethanol and motor spirit mixture or ethanol and petrol mixture, with more than 10% ethanol	9,204	0.5	18,946	0.6	6,840	1.8	S

S Withheld because estimate did not meet publication standards.
X Not applicable.
Z Rounds to zero.
[1] UN numbers shown had the highest estimated weight without considering sampling variability. Since an "All other UN numbers" line is not shown, estimates do not add to total.
[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table H5.

Hazardous Versus Nonhazardous Material Shipment Characteristics by Mode of Transportation for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Mode of transportation	Tons					Ton-miles[1]				
		Hazardous		Nonhazardous			Hazardous		Nonhazardous	
	Total (thousands)	2017 (thousands)	Percent of total	2017 (thousands)	Percent of total	Total (millions)	2017 (millions)	Percent of total	2017 (millions)	Percent of total
All modes	**12,468,902**	**2,967,965**	**23.8**	**9,500,936**	**76.2**	**3,116,876**	**382,472**	**12.3**	**2,734,404**	**87.7**
Single modes	**11,604,764**	**2,889,521**	**24.9**	**8,715,243**	**75.1**	**2,479,593**	**307,204**	**12.4**	**2,172,389**	**87.6**
Truck[2]	8,843,334	1,814,848	20.5	7,028,486	79.5	1,327,094	126,800	9.6	1,200,294	90.4
For-hire truck	5,232,034	932,658	17.8	4,299,376	82.2	1,162,179	92,146	7.9	1,070,033	92.1
Company-owned truck	3,611,300	882,190	24.4	2,729,110	75.6	164,915	34,655	21.0	130,260	79.0
Rail	1,251,240	90,387	7.2	1,160,853	92.8	824,763	61,669	7.5	763,093	92.5
Water	804,392	304,189	37.8	500,204	62.2	259,610	60,934	23.5	198,676	76.5
Inland water	471,854	171,346	36.3	300,508	63.7	177,494	29,043	16.4	148,451	83.6
Great Lakes	41,947	S	S	41,947	100.0	15,638	S	S	15,638	100.0
Deep sea	268,634	128,806	47.9	139,827	52.1	50,866	31,547	62.0	19,319	38.0
Multiple waterways	21,958	S	S	17,922	81.6	15,612	345	2.2	15,267	97.8
Air (includes truck and air)	8,019	251	3.1	7,768	96.9	9,822	201	2.1	9,621	97.9
Pipeline[3]	697,778	679,846	97.4	17,932	2.6	S	S	S	S	S
Multiple modes	**770,504**	**78,444**	**10.2**	**692,060**	**89.8**	**637,155**	**75,268**	**11.8**	**561,887**	**88.2**
Parcel, U.S. Postal Service, or courier	38,008	345	0.9	37,662	99.1	29,838	236	0.8	29,602	99.2
Truck and rail	471,398	70,185	14.9	401,213	85.1	443,188	70,337	15.9	372,851	84.1
Truck and water	109,861	6,167	5.6	103,693	94.4	51,853	3,269	6.3	48,585	93.7
Rail and water	143,013	1,481	1.0	141,532	99.0	102,715	1,175	1.1	101,540	98.9
Other multiple modes	8,224	265	3.2	7,958	96.8	9,562	253	2.6	9,309	97.4
Other modes	**93,634**	**S**	**S**	**93,634**	**100.0**	**128**	**S**	**S**	**128**	**100.0**

S Withheld because estimate did not meet publication standards.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[2] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[3] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table H6.

Shipment Characteristics by Selected Commodities[1] for Hazardous Materials for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value			Tons			Ton-miles[2]		
			Hazardous			Hazardous			Hazardous	
		Total (million dollars)	2017 (million dollars)	Percent of total	Total (thousands)	2017 (thousands)	Percent of total	Total (millions)	2017 (millions)	Percent of total
	All commodities[3]	**14,517,812**	**1,680,231**	**11.6**	**12,468,902**	**2,967,965**	**23.8**	**3,116,876**	**382,472**	**12.3**
	Subtotal for Selected Commodities	**2,259,062**	**1,589,253**	**10.9**	**3,563,357**	**2,942,134**	**23.6**	**558,337**	**372,267**	**11.9**
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	745,954	745,954	100.0	1,388,364	1,388,364	100.0	138,279	138,279	100.0
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	474,617	466,218	98.2	909,140	896,403	98.6	79,304	76,127	96.0
19	Other coal and petroleum products, n.e.c.	258,447	126,056	48.8	547,120	259,267	47.4	88,371	38,632	43.7
20	Basic chemicals	290,944	151,563	52.1	418,746	323,970	77.4	151,553	92,972	61.3
22	Fertilizers	57,886	14,581	25.2	172,509	44,200	25.6	40,112	12,320	30.7
23	Other chemical products and preparations	431,214	84,881	19.7	127,478	29,930	23.5	60,718	13,937	23.0

[1] Commodity codes shown had the highest estimated weight without considering sampling variability. Since an "All other SCTG" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] Estimates exclude shipments of crude petroleum (SCTG 16).

Notes: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Percentages represent the proportion of hazardous materials to the two-digit commodity total.

Table H7a.

Hazardous Material Shipment Characteristics by Selected Commodities[1] for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value		Tons		Ton-miles[2]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
	All commodities[3]	**1,680,231**	**100.0**	**2,967,965**	**100.0**	**382,472**	**100.0**	**189**
	Subtotal for Selected Commodities	**1,589,253**	**94.6**	**2,942,134**	**99.1**	**372,267**	**97.3**	**X**
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	745,954	44.4	1,388,364	46.8	138,279	36.2	44
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	466,218	27.7	896,403	30.2	76,127	19.9	36
19	Other coal and petroleum products, n.e.c.	126,056	7.5	259,267	8.7	38,632	10.1	41
20	Basic chemicals	151,563	9.0	323,970	10.9	92,972	24.3	127
22	Fertilizers	14,581	0.9	44,200	1.5	12,320	3.2	166
23	Other chemical products and preparations	84,881	5.1	29,930	1.0	13,937	3.6	717

X Not applicable.

[1] Commodity codes shown had the highest estimated weight without considering sampling variability. Since an "All other SCTG" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] Estimates exclude shipments of crude petroleum (SCTG 16).

Notes: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Percentages represent the proportion of hazardous materials to the two-digit commodity total.

Table H7b.

Hazardous Material Shipment Characteristics by Selected Commodities[1] for the United States: 2017 and 2012

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

SCTG code	Commodity description	Value			Tons			Ton-miles[2]			Average miles per shipment		
		2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change	2017	2012	Percent change
	All commodities[3]	**1,680,231**	**2,334,425**	**–28.0**	**2,967,965**	**2,580,153**	**15.0**	**382,472**	**307,524**	**24.4**	**189**	**114**	**65.9**
	Subtotal for Selected Commodities	**1,589,253**	**2,254,306**	**–29.5**	**2,942,134**	**2,554,674**	**15.2**	**372,267**	**293,488**	**26.8**	**X**	**X**	**X**
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	745,954	1,158,935	–35.6	1,388,364	1,244,059	11.6	138,279	97,395	42.0	44	46	–3.3
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	466,218	705,046	–33.9	896,403	841,978	6.5	76,127	58,809	29.4	36	31	16.1
19	Other coal and petroleum products, n.e.c.	126,056	126,580	–0.4	259,267	167,514	54.8	38,632	35,299	9.4	41	42	–2.4
20	Basic chemicals	151,563	180,947	–16.2	323,970	241,415	34.2	92,972	78,663	18.2	127	194	–34.5
22	Fertilizers	14,581	22,792	–36.0	44,200	40,685	8.6	12,320	15,410	–20.1	166	227	–27.1
23	Other chemical products and preparations	84,881	60,006	41.5	29,930	19,023	57.3	13,937	7,912	76.2	717	379	89.4

X Not applicable.

[1] Commodity codes shown had the highest estimated weight without considering sampling variability. Since an "All other SCTG" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] Estimates exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table H8a.

Hazardous Material Shipment Characteristics by Truck for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		2017 (million dollars)	Intrastate (percent of total)	Interstate (percent of total)	2017 (thousands)	Intrastate (percent of total)	Interstate (percent of total)	2017 (millions)	Intrastate (percent of total)	Interstate (percent of total)
	Total	**1,091,250**	**82.6**	**17.4**	**1,814,848**	**88.4**	**11.6**	**126,800**	**39.4**	**60.6**
	Subtotal for Selected UN/NA Numbers	**957,116**	**77.2**	**10.5**	**1,749,894**	**86.2**	**10.3**	**110,708**	**37.4**	**49.9**
1005	Ammonia, anhydrous	5,467	76.7	23.3	14,194	73.3	26.7	1,449	37.1	62.9
1013	Carbon dioxide	1,027	80.2	19.8	3,907	77.7	22.3	272	S	56.8
1066	Nitrogen, compressed	1,505	87.9	12.1	2,665	87.0	13.0	119	79.4	20.6
1072	Oxygen, compressed	2,709	89.9	10.1	6,157	77.4	22.6	S	28.2	S
1073	Oxygen, refrigerated liquid (cryogenic liquid)	892	74.4	25.6	10,477	69.5	30.5	1,383	32.3	67.7
1075	Petroleum gases, liquefied or liquefied petroleum gas	19,828	86.1	13.9	33,680	83.2	S	2,684	38.5	61.5
1170	Ethanol or ethyl alcohol or ethanol solutions or ethyl alcohol solutions	7,627	73.8	26.2	13,429	78.5	21.5	1,642	32.9	67.1
1202	Diesel fuel, including gas oil or heating oil, light	83,119	92.5	7.5	144,861	92.2	7.8	9,708	45.2	54.8
1203	Gasoline includes gasoline mixed with ethyl alcohol, with not more than 10% alcohol	440,210	92.3	7.7	794,208	93.2	6.8	33,803	46.9	53.1
1223	Kerosene	1,462	95.6	S	2,395	94.8	S	47	87.4	S
1263	Paint including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, liquid lacquer base, and paint related material including paint thinning, drying, removing or reducing compound	14,716	40.2	59.8	2,577	35.9	64.1	1,582	4.5	95.5
1268	Petroleum distillates, n.o.s. or petroleum products, n.o.s.	6,415	84.3	15.7	6,759	84.5	15.5	720	21.8	78.2
1270	Petroleum oil	3,954	82.4	17.6	3,788	84.1	15.9	403	28.2	71.8
1789	Hydrochloric acid	2,038	70.7	29.3	11,211	74.7	25.3	1,781	34.5	65.5
1791	Hypochlorite solutions	2,488	68.3	31.7	10,187	69.0	31.0	947	46.6	53.4
1814	Potassium hydroxide, solution	1,723	60.3	39.7	2,047	67.3	32.7	360	15.9	84.1
1824	Sodium hydroxide solution	5,234	47.6	52.4	12,073	59.6	40.4	1,813	26.3	73.7
1830	Sulfuric acid with more than 51% acid	4,149	76.3	23.7	15,262	69.3	30.7	2,195	30.3	69.7
1845	Carbon dioxide, solid or dry ice	822	S	25.8	2,896	S	29.2	358	28.2	71.8
1863	Fuel, aviation, turbine engine	10,547	94.2	5.8	21,586	94.0	6.0	1,817	51.1	48.9
1866	Resin solution, flammable	7,719	28.7	71.3	2,793	28.9	71.1	1,363	8.5	91.5
1951	Argon, refrigerated liquid (cryogenic liquid)	601	59.1	40.9	2,574	52.2	47.8	593	13.1	86.9
1977	Nitrogen, refrigerated liquid cryogenic liquid	2,309	79.7	20.3	25,938	72.3	27.7	2,529	33.0	67.0
1978	Propane, see also petroleum gases, liquefied	24,407	97.3	2.7	30,556	97.1	2.9	862	83.4	16.6
1987	Alcohols, n.o.s., including denatured alcohol	7,126	61.6	38.4	12,540	64.0	36.0	1,812	31.1	68.9
1993	Flammable liquids, n.o.s., including anti-freeze, liquid, combustible liquid, n.o.s., compounds, cleaning liquid, tree killing, diesel fuel, fuel oil (no. 1, 2, 4, 5, or 6), or plastic solvent, n.o.s.	240,651	92.8	7.2	437,437	94.1	5.9	22,603	62.5	37.5
1999	Tars, liquid including road oils and cutback bitumens, including road asphalt	9,444	60.0	40.0	41,600	71.0	29.0	4,824	20.6	79.4
2031	Nitric acid other than red fuming	S	S	25.1	S	S	8.4	S	S	36.8

See footnotes at end of table.

Table H8a.

Hazardous Material Shipment Characteristics by Truck for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		2017 (million dollars)	Intrastate (percent of total)	Interstate (percent of total)	2017 (thousands)	Intrastate (percent of total)	Interstate (percent of total)	2017 (millions)	Intrastate (percent of total)	Interstate (percent of total)
2187	Carbon dioxide, refrigerated liquid	573	61.1	38.9	7,375	58.4	41.6	790	29.7	70.3
2448	Sulfur, molten	278	74.3	25.7	5,744	73.0	27.0	1,035	12.5	87.5
2672	Ammonia solution, relative density between 0.880 and 0.957 at 15 degrees C in water, with more than 10% but not more than 35% ammonia	949	61.5	38.5	4,344	70.9	29.1	578	S	59.4
2693	Bisulfites, aqueous solutions, n.o.s.	521	52.8	47.2	2,379	58.2	41.8	390	30.7	69.3
2794	Batteries, wet, filled with acid, electric storage	17,199	65.7	34.3	4,611	64.7	35.3	968	18.0	82.0
3082	Environmentally hazardous substance, liquid, n.o.s., including hazardous waste, liquid, n.o.s., marine pollutants, liquid or solid, n.o.s., or other regulated substances, liquid, n.o.s.	9,925	43.5	56.5	4,776	34.9	65.1	1,964	6.9	93.1
3257	Elevated temperature liquid, n.o.s., at or above 100 C and below its flash point (including molten metals, molten salts, etc.)	10,097	67.5	32.5	30,606	67.9	32.1	3,336	45.1	54.9
3264	Corrosive liquid, acidic, inorganic, n.o.s.	1,265	34.8	65.2	1,925	69.5	30.5	394	20.5	79.5
3475	Ethanol and gasoline mixture or ethanol and motor spirit mixture or ethanol and petrol mixture, with more than 10% ethanol	7,099	67.0	S	14,263	67.7	S	S	10.4	S

S Withheld because estimate did not meet publication standards.

[1] UN numbers shown had the highest estimated weight without considering sampling variability. Since an "All other UN numbers" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

For purposes of this table, individual shipment data are classified as either completely "interstate" or completely "intrastate." All shipments with the state of destination different from the state of origin are classified as "interstate." All shipments having the state of origin the same as the state of destination are classified as "intrastate."

Table H8b.

Hazardous Material Shipment Characteristics by Rail for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		2017 (million dollars)	Intrastate (percent of total)	Interstate (percent of total)	2017 (thousands)	Intrastate (percent of total)	Interstate (percent of total)	2017 (millions)	Intrastate (percent of total)	Interstate (percent of total)
	Total	**39,040**	**35.8**	**64.2**	**90,387**	**38.2**	**61.8**	**61,669**	**9.6**	**90.4**
	Subtotal for Selected UN/NA Numbers	**34,368**	**32.8**	**55.2**	**85,175**	**36.4**	**57.9**	**57,793**	**9.1**	**84.6**
1005	Ammonia, anhydrous	169	S	39.9	S	S	35.3	215	S	99.0
1010	Butadienes, stabilized or butadienes and hydrocarbon mixture, stabilized containing more than 40% butadienes	321	S	64.7	243	27.1	72.9	S	S	S
1011	Butane see also petroleum gases, liquefied	118	81.6	18.4	366	76.8	23.2	S	4.5	S
1017	Chlorine	274	5.7	94.3	2,682	2.8	97.2	1,054	0.2	99.8
1040	Ethylene oxide or ethylene oxide with nitrogen up to a total pressure of 1 MPa (10 bar) at 50 degrees C	271	32.9	67.1	258	31.8	68.2	191	0.4	99.6
1075	Petroleum gases, liquefied or liquefied petroleum gas	1,226	26.8	73.2	2,592	26.1	73.9	1,216	S	90.5
1086	Vinyl chloride, stabilized	550	S	93.1	2,973	S	95.4	2,295	S	99.2
1114	Benzene	725	35.7	64.3	1,002	36.9	63.1	810	24.2	75.8
1170	Ethanol or ethyl alcohol or ethanol solutions or ethyl alcohol solutions	1,742	42.8	57.2	3,784	37.9	62.1	2,840	1.4	98.6
1202	Diesel fuel, including gas oil or heating oil, light	S	S	S	S	S	S	S	S	S
1203	Gasoline includes gasoline mixed with ethyl alcohol, with not more than 10% alcohol	2,973	S	52.4	4,329	S	37.0	2,516	S	76.4
1268	Petroleum distillates, n.o.s. or petroleum products, n.o.s.	S	S	13.9	S	S	9.0	601	S	48.1
1270	Petroleum oil	208	64.1	S	252	71.0	S	S	S	S
1286	Rosin oil	S	S	S	S	S	S	S	S	S
1307	Xylenes	248	S	98.1	336	S	97.7	180	S	98.7
1789	Hydrochloric acid	89	S	92.9	2,211	13.2	86.8	2,026	0.3	99.7
1791	Hypochlorite solutions	27	S	100.0	208	S	100.0	335	S	100.0
1805	Phosphoric acid solution	755	13.0	87.0	1,468	12.7	87.3	1,563	S	98.1
1814	Potassium hydroxide, solution	139	S	61.5	593	64.4	35.6	266	S	94.2
1824	Sodium hydroxide solution	1,558	S	78.7	6,095	19.2	80.8	6,118	S	94.6
1830	Sulfuric acid with more than 51% acid	S	S	42.4	S	S	41.1	S	S	42.1
1863	Fuel, aviation, turbine engine	90	100.0	S	217	100.0	S	S	S	S
1942	Ammonium nitrate, with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	228	S	100.0	1,108	S	100.0	1,159	S	100.0
1964	Hydrocarbon gas mixture, compressed, n.o.s.	S	S	S	190	S	100.0	198	S	100.0
1978	Propane, see also petroleum gases, liquefied	220	38.9	S	335	69.3	30.7	161	1.1	98.9
1987	Alcohols, n.o.s., including denatured alcohol	5,563	19.8	80.2	12,106	19.5	80.5	10,645	0.2	99.8

See footnotes at end of table.

Table H8b.

Hazardous Material Shipment Characteristics by Rail for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		2017 (million dollars)	Intrastate (percent of total)	Interstate (percent of total)	2017 (thousands)	Intrastate (percent of total)	Interstate (percent of total)	2017 (millions)	Intrastate (percent of total)	Interstate (percent of total)
1993	Flammable liquids, n.o.s., including anti-freeze, liquid, combustible liquid, n.o.s., compounds, cleaning liquid, tree killing, diesel fuel, fuel oil (no. 1, 2, 4, 5, or 6), or plastic solvent, n.o.s.	3,675	54.4	45.6	9,673	47.0	S	S	2.9	S
1999	Tars, liquid including road oils and cutback bitumens, including road asphalt	964	76.0	S	S	S	15.2	192	36.9	63.1
2015	Hydrogen peroxide, stabilized or hydrogen peroxide aqueous solutions, stabilized with more than 60% hydrogen peroxide	S	S	36.0	S	S	42.3	139	S	62.8
2055	Styrene monomer, stabilized	364	S	87.6	347	S	89.0	578	S	97.5
2078	Toluene diisocyanate	465	S	67.0	382	S	62.7	S	S	97.6
2187	Carbon dioxide, refrigerated liquid	S	S	S	1,219	S	S	S	S	S
2209	Formaldehyde solutions, with not less than 25% formaldehyde	S	S	42.2	S	S	S	S	S	S
2257	Potassium	119	S	100.0	683	S	100.0	1,040	S	100.0
2312	Phenol, molten	531	S	100.0	558	S	100.0	S	S	S
2448	Sulfur, molten	164	26.5	S	4,278	28.5	S	1,220	1.1	98.9
3077	Environmentally hazardous substance, solid, n.o.s., including hazardous waste, solid, n.o.s. or other regulated substances, solid, n.o.s.	1,000	7.4	92.6	644	8.5	91.5	828	1.6	98.4
3082	Environmentally hazardous substance, liquid, n.o.s., including hazardous waste, liquid, n.o.s., marine pollutants, liquid or solid, n.o.s., or other regulated substances, liquid, n.o.s.	2,608	5.7	94.3	S	3.3	S	2,002	0.8	99.2
3257	Elevated temperature liquid, n.o.s., at or above 100 C and below its flash point (including molten metals, molten salts, etc.)	S	S	17.4	S	S	10.9	S	S	22.7
3475	Ethanol and gasoline mixture or ethanol and motor spirit mixture or ethanol and petrol mixture, with more than 10% ethanol	597	22.6	77.4	1,379	25.7	74.3	1,029	S	95.7

S Withheld because estimate did not meet publication standards.

[1] UN numbers shown had the highest estimated weight without considering sampling variability. Since an "All other UN numbers" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

For purposes of this table, individual shipment data are classified as either completely "interstate" or completely "intrastate." All shipments with the state of destination different from the state of origin are classified as "interstate." All shipments having the state of origin the same as the state of destination are classified as "intrastate."

Table H8c.

Hazardous Material Shipment Characteristics by Water for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		2017 (million dollars)	Intrastate (percent of total)	Interstate (percent of total)	2017 (thousands)	Intrastate (percent of total)	Interstate (percent of total)	2017 (millions)	Intrastate (percent of total)	Interstate (percent of total)
	Total	**137,109**	**72.8**	**27.2**	**304,189**	**72.1**	**27.9**	**60,934**	**19.2**	**80.8**
	Subtotal for Selected UN/NA Numbers	**133,257**	**71.0**	**26.1**	**298,808**	**71.0**	**27.3**	**59,017**	**18.8**	**78.0**
1005	Ammonia, anhydrous	S	S	3.8	S	S	2.7	S	S	13.6
1086	Vinyl chloride, stabilized	1,066	100.0	S	1,798	100.0	S	493	100.0	S
1090	Acetone	340	S	100.0	447	S	100.0	363	S	100.0
1114	Benzene	4,743	47.1	S	9,735	62.3	S	S	3.3	S
1120	Butanols	S	S	S	S	S	S	S	S	S
1145	Cyclohexane	3,743	80.2	19.8	5,768	83.1	16.9	962	S	44.8
1170	Ethanol or ethyl alcohol or ethanol solutions or ethyl alcohol solutions	358	S	100.0	772	S	100.0	900	S	100.0
1202	Diesel fuel, including gas oil or heating oil, light	31,733	80.7	S	53,320	76.2	S	9,694	14.3	85.7
1203	Gasoline includes gasoline mixed with ethyl alcohol, with not more than 10% alcohol	30,792	69.2	30.8	56,774	68.3	31.7	12,637	S	82.9
1223	Kerosene	S	S	S	S	S	S	S	S	S
1230	Methanol	62	100.0	S	477	100.0	S	13	100.0	S
1268	Petroleum distillates, n.o.s. or petroleum products, n.o.s.	8,948	65.9	34.1	19,714	60.3	39.7	S	14.2	S
1270	Petroleum oil	S	S	S	S	S	S	S	S	S
1301	Vinyl acetate, stabilized	895	96.9	S	1,348	97.1	S	S	30.9	S
1307	Xylenes	907	S	S	1,446	S	S	S	0.8	S
1778	Fluorosilicic acid	218	100.0	S	422	100.0	S	2	100.0	S
1805	Phosphoric acid solution	228	100.0	S	441	100.0	S	2	100.0	S
1824	Sodium hydroxide solution	1,319	86.7	13.3	8,599	79.5	S	1,691	S	S
1830	Sulfuric acid with more than 51% acid	S	S	S	S	S	S	S	S	S
1831	Sulfuric acid, fuming	S	S	S	S	S	S	S	S	S
1863	Fuel, aviation, turbine engine	8,058	73.9	26.1	16,540	72.4	27.6	4,872	S	78.4
1918	Isopropylbenzene	1,737	S	33.9	1,965	S	44.1	S	S	96.3
1962	Ethylene	406	100.0	S	694	100.0	S	192	100.0	S
1993	Flammable liquids, n.o.s., including anti-freeze, liquid, combustible liquid, n.o.s., compounds, cleaning liquid, tree killing, diesel fuel, fuel oil (no. 1, 2, 4, 5, or 6), or plastic solvent, n.o.s.	28,013	80.8	19.2	69,679	80.1	19.9	7,211	17.3	82.7
1999	Tars, liquid including road oils and cutback bitumens, including road asphalt	S	S	S	S	S	S	S	S	S
2055	Styrene monomer, stabilized	1,391	44.6	55.4	1,327	45.5	54.5	1,219	9.3	90.7
2448	Sulfur, molten	S	S	S	9,625	S	S	S	S	S
2789	Acetic acid, glacial or acetic acid solution, with more than 80% acid, by mass	402	100.0	S	1,493	100.0	S	27	100.0	S

See footnotes at end of table.

Table H8c.

Hazardous Material Shipment Characteristics by Water for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		2017 (million dollars)	Intrastate (percent of total)	Interstate (percent of total)	2017 (thousands)	Intrastate (percent of total)	Interstate (percent of total)	2017 (millions)	Intrastate (percent of total)	Interstate (percent of total)
3082	Environmentally hazardous substance, liquid, n.o.s., including hazardous waste, liquid, n.o.s., marine pollutants, liquid or solid, n.o.s., or other regulated substances, liquid, n.o.s. . . .	S	S	S	S	S	S	S	S	S
3257	Elevated temperature liquid, n.o.s., at or above 100 C and below its flash point (including molten metals, molten salts, etc.)	2,407	57.0	S	9,136	63.7	S	S	S	S

S Withheld because estimate did not meet publication standards.

[1] UN numbers shown had the highest estimated weight without considering sampling variability. Since an "All other UN numbers" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

For purposes of this table, individual shipment data are classified as either completely "interstate" or completely "intrastate." All shipments with the state of destination different from the state of origin are classified as "interstate." All shipments having the state of origin the same as the state of destination are classified as "intrastate."

Table H8d.

Hazardous Material Shipment Characteristics by Pipeline for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		2017 (million dollars)	Intrastate (percent of total)	Interstate (percent of total)	2017 (thousands)	Intrastate (percent of total)	Interstate (percent of total)	2017 (millions)	Intrastate (percent of total)	Interstate (percent of total)
	Total	**339,912**	**80.6**	**19.4**	**679,846**	**81.7**	**18.3**	**S**	**32.9**	**67.1**
	Subtotal for Selected UN/NA Numbers	**336,973**	**79.7**	**19.4**	**672,387**	**80.7**	**18.2**	**57,339**	**32.7**	**66.8**
1011	Butane see also petroleum gases, liquefied	952	100.0	S	2,106	100.0	S	S	S	S
1017	Chlorine	446	100.0	S	2,206	100.0	S	S	100.0	S
1038	Ethylene, refrigerated liquid (cryogenic liquid)	S	S	S	S	S	S	S	S	S
1040	Ethylene oxide or ethylene oxide with nitrogen up to a total pressure of 1 MPa (10 bar) at 50 degrees C	573	100.0	S	804	100.0	S	S	100.0	S
1049	Hydrogen, compressed	448	100.0	S	954	100.0	S	S	100.0	S
1066	Nitrogen, compressed	92	100.0	S	4,731	100.0	S	S	100.0	S
1072	Oxygen, compressed	S	S	S	S	S	S	S	100.0	S
1075	Petroleum gases, liquefied or liquefied petroleum gas	4,559	S	S	5,587	84.8	S	S	46.5	S
1077	Propylene see also petroleum gases, liquefied	1,477	100.0	S	1,926	100.0	S	S	100.0	S
1086	Vinyl chloride, stabilized	993	100.0	S	1,813	100.0	S	S	100.0	S
1114	Benzene	S	S	S	S	S	S	S	S	S
1202	Diesel fuel, including gas oil or heating oil, light	43,512	80.1	19.9	93,367	83.5	16.5	S	23.7	76.3
1203	Gasoline includes gasoline mixed with ethyl alcohol, with not more than 10% alcohol	190,319	77.2	22.8	355,323	77.9	22.1	S	32.0	68.0
1223	Kerosene	2,580	40.3	S	5,843	40.4	S	S	2.0	98.0
1268	Petroleum distillates, n.o.s. or petroleum products, n.o.s.	7,168	82.4	17.6	15,976	81.1	18.9	S	S	31.4
1270	Petroleum oil	726	84.4	S	1,349	76.3	S	S	3.9	S
1307	Xylenes	S	S	S	S	S	S	S	S	S
1824	Sodium hydroxide solution	705	100.0	S	2,701	100.0	S	S	100.0	S
1830	Sulfuric acid with more than 51% acid	172	99.9	S	2,856	99.9	S	S	95.4	S
1863	Fuel, aviation, turbine engine	25,085	86.7	13.3	54,986	87.4	12.6	S	38.7	61.3
1920	Nonanes	S	S	S	S	S	S	S	S	S
1962	Ethylene	1,121	93.9	6.1	1,984	94.0	6.0	S	88.4	11.6
1964	Hydrocarbon gas mixture, compressed, n.o.s.	750	97.9	S	4,238	96.9	S	S	65.9	S
1965	Hydrocarbon gas mixture, liquefied, n.o.s.	543	100.0	S	1,724	100.0	S	S	100.0	S
1977	Nitrogen, refrigerated liquid cryogenic liquid	S	S	S	1,624	100.0	S	S	S	S
1978	Propane, see also petroleum gases, liquefied	4,146	81.1	18.9	8,205	81.2	18.8	S	S	69.3
1993	Flammable liquids, n.o.s., including anti-freeze, liquid, combustible liquid, n.o.s., compounds, cleaning liquid, tree killing, diesel fuel, fuel oil (no. 1, 2, 4, 5, or 6), or plastic solvent, n.o.s	41,955	85.6	14.4	88,994	87.2	12.8	S	51.5	S
1999	Tars, liquid including road oils and cutback bitumens, including road asphalt	S	S	S	S	30.8	S	S	1.3	S

See footnotes at end of table.

Table H8d.

Hazardous Material Shipment Characteristics by Pipeline for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		2017 (million dollars)	Intrastate (percent of total)	Interstate (percent of total)	2017 (thousands)	Intrastate (percent of total)	Interstate (percent of total)	2017 (millions)	Intrastate (percent of total)	Interstate (percent of total)
2187	Carbon dioxide, refrigerated liquid	S	S	S	S	S	S	S	S	S
2398	Methyl tert-butyl ether	581	100.0	S	972	100.0	S	S	100.0	S

S Withheld because estimate did not meet publication standards.

[1] UN numbers shown had the highest estimated weight without considering sampling variability. Since an "All other UN numbers" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

For purposes of this table, individual shipment data are classified as either completely "interstate" or completely "intrastate." All shipments with the state of destination different from the state of origin are classified as "interstate." All shipments having the state of origin the same as the state of destination are classified as "intrastate."

Table H8e.

Hazardous Material Shipment Characteristics by Truck-Rail for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		2017 (million dollars)	Intrastate (percent of total)	Interstate (percent of total)	2017 (thousands)	Intrastate (percent of total)	Interstate (percent of total)	2017 (millions)	Intrastate (percent of total)	Interstate (percent of total)
	Total	**35,697**	**12.5**	**87.5**	**70,185**	**11.7**	**88.3**	**70,337**	**2.3**	**97.7**
	Subtotal for Selected UN/NA Numbers	**28,163**	**9.5**	**69.4**	**61,581**	**9.4**	**78.4**	**62,643**	**1.7**	**87.3**
1005	Ammonia, anhydrous	70	S	92.2	S	S	S	S	S	S
1010	Butadienes, stabilized or butadienes and hydrocarbon mixture, stabilized containing more than 40% butadienes	319	S	90.6	268	S	85.4	279	S	97.0
1013	Carbon dioxide	22	S	100.0	S	S	S	S	S	S
1017	Chlorine	112	9.6	S	602	8.0	92.0	208	2.8	97.2
1055	Isobutylene see also petroleum gases, liquefied	105	S	100.0	273	S	100.0	82	S	100.0
1075	Petroleum gases, liquefied or liquefied petroleum gas	2,022	20.1	79.9	3,604	22.4	77.6	2,479	9.3	90.7
1093	Acrylonitrile, stabilized	428	26.9	73.1	373	27.7	72.3	244	4.8	95.2
1114	Benzene	690	S	98.1	952	S	98.0	858	S	98.1
1170	Ethanol or ethyl alcohol or ethanol solutions or ethyl alcohol solutions	2,744	2.0	98.0	6,085	2.2	97.8	7,640	0.4	99.6
1202	Diesel fuel, including gas oil or heating oil, light	1,523	54.2	45.8	2,841	53.4	46.6	1,497	2.7	97.3
1203	Gasoline includes gasoline mixed with ethyl alcohol, with not more than 10% alcohol	S	12.8	S	S	10.6	S	S	0.8	S
1247	Methyl methacrylate monomer, stabilized	474	S	99.7	441	S	99.8	491	S	100.0
1268	Petroleum distillates, n.o.s. or petroleum products, n.o.s.	515	S	S	790	36.0	S	S	5.8	S
1270	Petroleum oil	229	S	57.6	279	39.1	60.9	S	9.5	S
1495	Sodium chlorate	S	S	S	S	S	S	S	S	S
1789	Hydrochloric acid	S	1.8	S	S	2.1	S	S	0.3	S
1791	Hypochlorite solutions	82	3.7	96.3	451	7.4	92.6	255	0.4	99.6
1805	Phosphoric acid solution	196	S	97.3	433	S	98.4	439	S	99.7
1814	Potassium hydroxide, solution	156	S	78.3	296	9.3	90.7	282	2.0	98.0
1824	Sodium hydroxide solution	904	12.0	88.0	4,470	13.1	86.9	3,504	4.6	95.4
1830	Sulfuric acid with more than 51% acid	379	15.0	85.0	3,723	17.7	82.3	3,065	S	96.5
1942	Ammonium nitrate, with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	112	S	100.0	553	S	100.0	779	S	100.0
1978	Propane, see also petroleum gases, liquefied	S	5.4	S	285	10.0	90.0	156	0.2	99.8
1986	Alcohols, flammable, toxic n.o.s.	S	S	S	S	S	S	S	S	S
1987	Alcohols, n.o.s., including denatured alcohol	3,577	4.4	95.6	7,390	5.1	94.9	9,648	S	98.6
1993	Flammable liquids, n.o.s., including anti-freeze, liquid, combustible liquid, n.o.s., compounds, cleaning liquid, tree killing, diesel fuel, fuel oil (no. 1, 2, 4, 5, or 6), or plastic solvent, n.o.s.	2,965	11.3	88.7	5,180	6.7	93.3	7,019	0.9	99.1
1999	Tars, liquid including road oils and cutback bitumens, including road asphalt	558	7.5	92.5	1,461	10.9	89.1	693	3.7	96.3

See footnotes at end of table.

Table H8e.

Hazardous Material Shipment Characteristics by Truck-Rail for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		2017 (million dollars)	Intrastate (percent of total)	Interstate (percent of total)	2017 (thousands)	Intrastate (percent of total)	Interstate (percent of total)	2017 (millions)	Intrastate (percent of total)	Interstate (percent of total)
2014	Hydrogen peroxide, aqueous solutions with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)	78	13.8	86.2	274	14.8	85.2	221	7.5	92.5
2055	Styrene monomer, stabilized	S	14.0	S	S	14.2	S	S	1.8	S
2187	Carbon dioxide, refrigerated liquid	S	S	S	1,056	S	98.3	502	S	98.6
2218	Acrylic acid, stabilized	235	S	97.1	316	S	95.7	348	S	98.6
2257	Potassium	230	S	100.0	1,310	S	100.0	1,675	S	100.0
2280	Hexamethylenediamine, solid	1,212	4.8	95.2	709	5.1	94.9	1,194	0.3	99.7
2312	Phenol, molten	395	S	76.0	410	S	73.2	489	S	94.9
2448	Sulfur, molten	45	3.9	96.1	919	3.0	97.0	1,071	0.1	99.9
2672	Ammonia solution, relative density between 0.880 and 0.957 at 15 degrees C in water, with more than 10% but not more than 35% ammonia	59	S	100.0	351	S	100.0	279	S	100.0
3077	Environmentally hazardous substance, solid, n.o.s., including hazardous waste, solid, n.o.s. or other regulated substances, solid, n.o.s.	994	S	96.9	887	S	96.7	1,517	S	99.7
3082	Environmentally hazardous substance, liquid, n.o.s., including hazardous waste, liquid, n.o.s., marine pollutants, liquid or solid, n.o.s., or other regulated substances, liquid, n.o.s.	2,064	7.0	93.0	2,584	S	95.5	3,216	S	97.5
3257	Elevated temperature liquid, n.o.s., at or above 100 C and below its flash point (including molten metals, molten salts, etc.)	S	S	S	1,099	26.9	73.1	1,035	6.9	93.1
3475	Ethanol and gasoline mixture or ethanol and motor spirit mixture or ethanol and petrol mixture, with more than 10% ethanol	1,385	S	100.0	3,050	S	100.0	3,167	S	100.0

S Withheld because estimate did not meet publication standards.

[1] UN numbers shown had the highest estimated weight without considering sampling variability. Since an "All other UN numbers" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

For purposes of this table, individual shipment data are classified as either completely "interstate" or completely "intrastate." All shipments with the state of destination different from the state of origin are classified as "interstate." All shipments having the state of origin the same as the state of destination are classified as "intrastate."

Table H9.

Hazardous Material Shipment Characteristics for Toxic by Inhalation (TIH) for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Description	Value		Tons		Ton-miles[1]	
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total
Total	**1,680,231**	**100.0**	**2,967,965**	**100.0**	**382,472**	**100.0**
Toxic by Inhalation	13,536	0.8	32,307	1.1	6,128	1.6

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Toxic by inhalation (TIH) gases and volatile liquids that are toxic when inhaled.

Table H10.

Hazardous Material Shipment Characteristics for Packing Group I for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Description	Value		Tons		Ton-miles[1]	
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total
Total	**1,680,231**	**100.0**	**2,967,965**	**100.0**	**382,472**	**100.0**
Packaging Group I	468,696	27.9	817,501	27.5	108,445	28.4

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Packing Groups I, II, and III reflect the level of hazard associated with the material being shipped. Packing Group I is the most rigorous.

Table H11a.

Hazardous Material Shipment Characteristics for Export by Country of Destination: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Country of destination	Value		Tons		Ton-Miles[1]	
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total
Total	**70,596**	**100.0**	**77,553**	**100.0**	**17,469**	**100.0**
Canada	9,167	13.0	8,132	10.5	6,439	36.9
Mexico	19,767	28.0	29,962	38.6	4,945	28.3
Rest of Americas	18,366	26.0	24,052	31.0	1,292	7.4
Europe and Africa	11,638	16.5	7,007	9.0	1,298	7.4
Asia and Oceania	11,658	16.5	8,400	10.8	3,495	20.0

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table H11b.

Hazardous Material Shipment Characteristics for Export by Country of Destination: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys. Because of rounding, estimates may not be additive]

Country of destination	Value			Tons			Ton-Miles[1]		
	2017 (million dollars)	2012 (million dollars)	Percent change	2017 (thousands)	2012 (thousands)	Percent change	2017 (millions)	2012 (millions)	Percent change
Total	**70,596**	**80,507**	**–12.3**	**77,553**	**78,409**	**–1.1**	**17,469**	**12,778**	**36.7**
Canada	9,167	8,081	13.4	8,132	6,467	25.8	6,439	3,285	96.0
Mexico	19,767	18,777	5.3	29,962	25,371	18.1	4,945	5,744	–13.9
All other countries	41,662	53,650	–22.3	39,459	46,572	–15.3	6,085	3,749	62.3

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table H12.

Hazardous Material Shipment Characteristics by Selected NAICS[1] Code and Mode of Transportation for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

NAICS code	NAICS description and mode of transportation	Value		Tons		Ton-miles[2]	
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total
	All Sectors						
	All modes	**1,680,231**	**100.0**	**2,967,965**	**100.0**	**382,472**	**100.0**
	Single modes	**1,612,129**	**95.9**	**2,889,521**	**97.4**	**307,204**	**80.3**
	Truck[3]	1,091,250	64.9	1,814,848	61.1	126,800	33.2
	For-hire truck	567,599	33.8	932,658	31.4	92,146	24.1
	Company-owned truck	523,651	31.2	882,190	29.7	34,655	9.1
	Rail	39,040	2.3	90,387	3.0	61,669	16.1
	Water	137,109	8.2	304,189	10.2	60,934	15.9
	Inland water	72,179	4.3	171,346	5.8	29,043	7.6
	Great Lakes	S	S	S	S	S	S
	Deep sea	63,134	3.8	128,806	4.3	31,547	8.2
	Multiple waterways	S	S	S	S	345	0.1
	Air (includes truck and air)	4,817	0.3	251	Z	201	0.1
	Pipeline[4]	339,912	20.2	679,846	22.9	S	S
	Multiple modes	**68,101**	**4.1**	**78,444**	**2.6**	**75,268**	**19.7**
	Parcel, U.S. Postal Service, or courier	13,475	0.8	345	Z	236	0.1
	Truck and rail	35,697	2.1	70,185	2.4	70,337	18.4
	Truck and water	16,504	1.0	6,167	0.2	3,269	0.9
	Rail and water	1,121	0.1	1,481	Z	1,175	0.3
	Other multiple modes	1,305	0.1	265	Z	253	0.1
	Other modes	**S**	**S**	**S**	**S**	**S**	**S**
324	**Petroleum and Coal Products Manufacturing**						
	All modes	**484,481**	**100.0**	**1,011,802**	**100.0**	**145,039**	**100.0**
	Single modes	**479,127**	**98.9**	**998,994**	**98.7**	**132,972**	**91.7**
	Truck[3]	60,646	12.5	151,701	15.0	18,886	13.0
	For-hire truck	56,061	11.6	137,746	13.6	17,796	12.3
	Company-owned truck	4,585	0.9	13,955	1.4	1,091	0.8
	Rail	11,801	2.4	28,262	2.8	17,676	12.2
	Water	93,320	19.3	201,955	20.0	42,192	29.1
	Inland water	41,374	8.5	100,398	9.9	16,073	11.1
	Great Lakes	S	S	S	S	S	S
	Deep sea	50,563	10.4	98,068	9.7	25,899	17.9
	Multiple waterways	S	S	S	S	S	S
	Air (includes truck and air)	S	S	S	S	S	S
	Pipeline[4]	313,360	64.7	617,076	61.0	S	S
	Multiple modes	**5,354**	**1.1**	**12,808**	**1.3**	**12,068**	**8.3**
	Parcel, U.S. Postal Service, or courier	10	Z	1	Z	Z	Z
	Truck and rail	4,713	1.0	11,959	1.2	11,950	8.2
	Truck and water	359	0.1	294	Z	87	0.1
	Rail and water	263	0.1	552	0.1	26	Z
	Other multiple modes	S	S	2	Z	3	Z
	Other modes	**S**	**S**	**S**	**S**	**S**	**S**
325	**Chemical Manufacturing**						
	All modes	**176,607**	**100.0**	**291,056**	**100.0**	**126,565**	**100.0**
	Single modes	**136,102**	**77.1**	**241,338**	**82.9**	**75,628**	**59.8**
	Truck[3]	77,974	44.2	113,767	39.1	24,695	19.5
	For-hire truck	67,589	38.3	67,443	23.2	20,352	16.1
	Company-owned truck	10,385	5.9	46,324	15.9	4,343	3.4
	Rail	22,394	12.7	47,075	16.2	38,700	30.6
	Water	20,809	11.8	47,709	16.4	10,890	8.6
	Inland water	12,216	6.9	25,359	8.7	6,123	4.8
	Great Lakes	S	S	S	S	S	S
	Deep sea	8,179	4.6	21,804	7.5	4,643	3.7
	Multiple waterways	414	0.2	547	0.2	S	S
	Air (includes truck and air)	1,698	1.0	158	0.1	82	0.1
	Pipeline[4]	13,227	7.5	32,629	11.2	S	S
	Multiple modes	**40,505**	**22.9**	**49,718**	**17.1**	**50,937**	**40.2**
	Parcel, U.S. Postal Service, or courier	3,175	1.8	37	Z	33	Z
	Truck and rail	25,747	14.6	45,270	15.6	48,852	38.6
	Truck and water	11,064	6.3	3,924	1.3	1,617	1.3
	Rail and water	328	0.2	427	0.1	382	0.3
	Other multiple modes	192	0.1	61	Z	53	Z
	Other modes	**S**	**S**	**S**	**S**	**S**	**S**

See footnotes at end of table.

Table H12.

Hazardous Material Shipment Characteristics by Selected NAICS[1] Code and Mode of Transportation for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

NAICS code	NAICS description and mode of transportation	Value		Tons		Ton-miles[2]	
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total
4246	**Chemical and Allied Products Merchant Wholesalers**						
	All modes	**60,388**	**100.0**	**116,686**	**100.0**	**17,764**	**100.0**
	Single modes	**58,486**	**96.9**	**111,536**	**95.6**	**14,195**	**79.9**
	Truck[3]	56,401	93.4	92,069	78.9	11,819	66.5
	For-hire truck	22,889	37.9	35,585	30.5	7,781	43.8
	Company-owned truck	33,512	55.5	56,484	48.4	4,038	22.7
	Rail	S	S	1,912	1.6	S	S
	Water	S	S	S	S	S	S
	Inland water	S	S	S	S	S	S
	Great Lakes	S	S	S	S	S	S
	Deep sea	S	S	S	S	S	S
	Multiple waterways	S	S	S	S	S	S
	Air (includes truck and air)	272	0.5	9	Z	6	Z
	Pipeline[4]	S	S	S	S	S	S
	Multiple modes	**1,902**	**3.1**	**S**	**S**	**S**	**S**
	Parcel, U.S. Postal Service, or courier	634	1.1	51	Z	S	S
	Truck and rail	590	1.0	S	S	S	S
	Truck and water	676	1.1	S	S	S	S
	Rail and water	S	S	S	S	S	S
	Other multiple modes	1	Z	S	S	Z	Z
	Other modes	**S**	**S**	**S**	**S**	**S**	**S**
4247	**Petroleum and Petroleum Products Merchant Wholesalers**						
	All modes	**764,098**	**100.0**	**1,383,742**	**100.0**	**73,573**	**100.0**
	Single modes	**761,454**	**99.7**	**1,378,789**	**99.6**	**70,846**	**96.3**
	Truck[3]	727,516	95.2	1,313,407	94.9	60,904	82.8
	For-hire truck	355,448	46.5	665,163	48.1	39,463	53.6
	Company-owned truck	372,068	48.7	648,244	46.8	21,441	29.1
	Rail	3,021	0.4	9,567	0.7	S	S
	Water	21,244	2.8	37,661	2.7	S	S
	Inland water	16,893	2.2	28,779	2.1	S	S
	Great Lakes	S	S	S	S	S	S
	Deep sea	4,351	0.6	8,882	0.6	S	S
	Multiple waterways	S	S	S	S	S	S
	Air (includes truck and air)	125	Z	48	Z	71	0.1
	Pipeline[4]	9,548	1.2	18,107	1.3	S	S
	Multiple modes	**2,644**	**0.3**	**4,953**	**0.4**	**2,727**	**3.7**
	Parcel, U.S. Postal Service, or courier	179	Z	S	S	S	S
	Truck and rail	1,930	0.3	3,803	0.3	S	S
	Truck and water	536	0.1	1,102	0.1	S	S
	Rail and water	S	S	S	S	S	S
	Other multiple modes	S	S	S	S	S	S
	Other modes	**S**	**S**	**S**	**S**	**S**	**S**
45431	**Fuel Dealers**						
	All modes	**33,205**	**100.0**	**52,772**	**100.0**	**1,113**	**100.0**
	Single modes	**33,186**	**99.9**	**52,754**	**100.0**	**1,098**	**98.7**
	Truck	33,158	99.9	52,719	99.9	1,087	97.7
	For-hire truck	1,484	4.5	2,422	4.6	111	9.9
	Company-owned truck	31,673	95.4	50,297	95.3	976	87.7
	Rail	S	S	S	S	S	S
	Water	22	0.1	27	0.1	10	0.9
	Inland water	8	Z	8	Z	7	0.7
	Great Lakes	S	S	S	S	S	S
	Deep sea	S	S	S	S	S	S
	Multiple waterways	S	S	S	S	S	S
	Air (includes truck and air)	S	S	S	S	S	S
	Pipeline	2	Z	4	Z	S	S
	Multiple modes	**18**	**0.1**	**S**	**S**	**S**	**S**
	Parcel, U.S. Postal Service, or courier	S	S	1	Z	S	S
	Truck and rail	S	S	S	S	S	S
	Truck and water	S	S	17	Z	S	S
	Rail and water	S	S	S	S	S	S
	Other multiple modes	S	S	S	S	S	S
	Other modes	**S**	**S**	**S**	**S**	**S**	**S**

See footnotes at end of table.

Table H12.

Hazardous Material Shipment Characteristics by Selected NAICS[1] Code and Mode of Transportation for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

NAICS code	NAICS description and mode of transportation	Value		Tons		Ton-miles[2]	
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total
4931	**Warehousing and Storage**						
	All modes	**30,847**	**100.0**	**33,522**	**100.0**	**1,984**	**100.0**
	Single modes	**29,950**	**97.1**	**33,451**	**99.8**	**1,929**	**97.2**
	Truck[3]	29,597	95.9	32,551	97.1	1,776	89.5
	For-hire truck	6,215	20.1	3,657	10.9	573	28.9
	Company-owned truck	23,382	75.8	28,894	86.2	1,203	60.6
	Rail	S	S	S	S	S	S
	Water	212	0.7	491	1.5	S	S
	Inland water	212	0.7	491	1.5	S	S
	Great Lakes	S	S	S	S	S	S
	Deep sea	S	S	S	S	S	S
	Multiple waterways	S	S	S	S	S	S
	Air (includes truck and air)	13	Z	Z	Z	S	S
	Pipeline[4]	S	S	405	1.2	S	S
	Multiple modes	**896**	**2.9**	**71**	**0.2**	**55**	**2.8**
	Parcel, U.S. Postal Service, or courier	284	0.9	9	Z	6	0.3
	Truck and rail	S	S	33	0.1	30	1.5
	Truck and water	488	1.6	S	S	S	S
	Rail and water	S	S	S	S	S	S
	Other multiple modes	S	S	S	S	S	S
	Other modes	**S**	**S**	**S**	**S**	**S**	**S**

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] NAICS codes shown had the highest estimated weight without considering sampling variability and are shown in descending order.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[4] Estimates exclude shipments of crude petroleum (SCTG 16).

Notes: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

NAICS codes shown are those covered in the Commodity Flow Survey.

Table H13.

Hazardous Material Shipment Characteristics of Temperature Controlled[1] Shipments by Mode of Transportation for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Mode of transportation	Value		Tons		Ton-miles[2]		Average miles per shipment
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
All modes	**72,742**	**100.0**	**196,285**	**100.0**	**34,988**	**100.0**	**463**
Single modes	**64,735**	**89.0**	**186,083**	**94.8**	**26,760**	**76.5**	**84**
Truck[3]	46,841	64.4	136,539	69.6	16,428	47.0	75
For-hire truck	32,289	44.4	76,156	38.8	11,842	33.8	161
Company-owned truck	14,552	20.0	60,382	30.8	4,586	13.1	38
Rail	4,941	6.8	12,559	6.4	6,681	19.1	513
Water	10,819	14.9	31,293	15.9	3,570	10.2	200
Inland water	6,936	9.5	21,983	11.2	2,153	6.2	S
Great Lakes	S	S	S	S	S	S	S
Deep sea	3,883	5.3	9,310	4.7	S	S	285
Multiple waterways	S	S	S	S	S	S	S
Air (includes truck and air)	889	1.2	S	S	25	0.1	1,417
Pipeline[4]	1,246	1.7	5,632	2.9	S	S	S
Multiple modes	**8,006**	**11.0**	**10,202**	**5.2**	**8,229**	**23.5**	**833**
Parcel, U.S. Postal Service, or courier	1,424	2.0	24	Z	S	S	834
Truck and rail	4,627	6.4	9,297	4.7	7,884	22.5	821
Truck and water	S	S	S	S	186	0.5	422
Rail and water	S	S	S	S	S	S	S
Other multiple modes	S	S	S	S	S	S	S
Other modes	**S**	**S**	**S**	**S**	**S**	**S**	**S**

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[4] Estimates exclude shipments of crude petroleum (SCTG 16).

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table H14.

Hazardous Material Shipment Characteristics of Temperature Controlled[1] Shipments by Selected UN/NA Numbers[2] for the United States: 2017–Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value		Tons		Ton-miles[3]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
	Total	**72,742**	**100.0**	**196,285**	**100.0**	**34,988**	**100.0**	**463**
	Subtotal for Selected UN/NA Numbers	**63,910**	**87.6**	**193,465**	**98.9**	**33,688**	**96.3**	**X**
1005	Ammonia, anhydrous	2,777	3.8	9,552	4.9	S	S	84
1013	Carbon dioxide	S	S	S	S	S	S	80
1040	Ethylene oxide or ethylene oxide with nitrogen up to a total pressure of 1 MPa (10 bar) at 50 degrees C	599	0.8	S	S	205	0.6	662
1046	Helium, compressed	364	0.5	141	0.1	S	S	47
1066	Nitrogen, compressed	275	0.4	1,370	0.7	76	0.2	40
1072	Oxygen, compressed	87	0.1	729	0.4	8	Z	97
1073	Oxygen, refrigerated liquid (cryogenic liquid)	927	1.3	11,083	5.6	1,386	4.0	79
1075	Petroleum gases, liquefied or liquefied petroleum gas	1,456	2.0	2,392	1.2	106	0.3	20
1086	Vinyl chloride, stabilized	502	0.7	897	0.5	S	S	S
1145	Cyclohexane	2,210	3.0	2,789	1.4	549	1.6	S
1170	Ethanol or ethyl alcohol or ethanol solutions or ethyl alcohol solutions	1,064	1.5	2,120	1.1	660	1.9	654
1202	Diesel fuel, including gas oil or heating oil, light	S	S	S	S	S	S	S
1230	Methanol	69	0.1	S	S	S	S	277
1263	Paint including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, liquid lacquer base, and paint related material including paint thinning, drying, removing or reducing compound	2,409	3.3	190	0.1	84	0.2	350
1268	Petroleum distillates, n.o.s. or petroleum products, n.o.s.	573	0.8	S	S	S	S	S
1270	Petroleum oil	S	S	S	S	S	S	47
1286	Rosin oil	S	S	S	S	S	S	S
1350	Sulfur	10	Z	239	0.1	2	Z	8
1789	Hydrochloric acid	89	0.1	123	0.1	4	Z	580
1791	Hypochlorite solutions	200	0.3	1,148	0.6	420	1.2	235
1805	Phosphoric acid solution	S	S	S	S	S	S	756
1824	Sodium hydroxide solution	762	1.0	1,348	0.7	S	S	231
1845	Carbon dioxide, solid or dry ice	1,377	1.9	2,902	1.5	362	1.0	214
1863	Fuel, aviation, turbine engine	1,125	1.5	2,502	1.3	255	0.7	100
1866	Resin solution, flammable	1,416	1.9	334	0.2	117	0.3	324
1942	Ammonium nitrate, with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	316	0.4	1,560	0.8	1,803	5.2	628
1951	Argon, refrigerated liquid (cryogenic liquid)	423	0.6	2,283	1.2	644	1.8	205
1956	Compressed gas, n.o.s.	251	0.3	180	0.1	76	0.2	283
1965	Hydrocarbon gas mixture, liquefied, n.o.s.	S	S	S	S	21	0.1	S
1966	Hydrogen, refrigerated liquid (cryogenic liquid)	S	S	157	0.1	56	0.2	421
1972	Methane, refrigerated liquid (cryogenic liquid) or natural gas, refrigerated liquid (cryogenic liquid), with high methane content	109	0.1	363	0.2	69	0.2	88
1977	Nitrogen, refrigerated liquid cryogenic liquid	2,461	3.4	27,563	14.0	2,543	7.3	47
1978	Propane, see also petroleum gases, liquefied	348	0.5	599	0.3	19	0.1	23
1987	Alcohols, n.o.s., including denatured alcohol	1,351	1.9	2,533	1.3	1,102	3.2	218
1993	Flammable liquids, n.o.s., including anti-freeze, liquid, combustible liquid, n.o.s., compounds, cleaning liquid, tree killing, diesel fuel, fuel oil (no. 1, 2, 4, 5, or 6), or plastic solvent, n.o.s.	3,084	4.2	S	S	794	2.3	148
1999	Tars, liquid including road oils and cutback bitumens, including road asphalt	7,432	10.2	27,676	14.1	3,517	10.1	106

See footnotes at end of table.

Table H14.

Hazardous Material Shipment Characteristics of Temperature Controlled[1] Shipments by Selected UN/NA Numbers[2] for the United States: 2017–Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value		Tons		Ton-miles[3]		Average miles per shipment
		2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
2055	Styrene monomer, stabilized	2,066	2.8	1,884	1.0	1,957	5.6	423
2187	Carbon dioxide, refrigerated liquid	754	1.0	10,792	5.5	1,841	5.3	69
2209	Formaldehyde solutions, with not less than 25% formaldehyde	50	0.1	337	0.2	32	0.1	234
2426	Ammonium nitrate, liquid (hot concentrated solution)	76	0.1	370	0.2	121	0.3	340
2448	Sulfur, molten	S	S	S	S	1,092	3.1	235
2672	Ammonia solution, relative density between 0.880 and 0.957 at 15 degrees C in water, with more than 10% but not more than 35% ammonia	S	S	626	0.3	S	S	142
2752	1,2-Epoxy-3-ethoxypropane	S	S	S	S	S	S	S
2785	4-Thiapentanal	87	0.1	151	0.1	22	0.1	146
3077	Environmentally hazardous substance, solid, n.o.s., including hazardous waste, solid, n.o.s. or other regulated substances, solid, n.o.s.	403	0.6	114	0.1	72	0.2	510
3082	Environmentally hazardous substance, liquid, n.o.s., including hazardous waste, liquid, n.o.s., marine pollutants, liquid or solid, n.o.s., or other regulated substances, liquid, n.o.s.	2,548	3.5	1,501	0.8	1,154	3.3	504
3256	Elevated temperature liquid, flammable, n.o.s., with flash point above 37.8 C, at or above its flash point	S	S	S	S	69	0.2	S
3257	Elevated temperature liquid, n.o.s., at or above 100 C and below its flash point (including molten metals, molten salts, etc.)	16,223	22.3	47,590	24.2	7,203	20.6	129
3265	Corrosive liquid, acidic, organic, n.o.s.	157	0.2	155	0.1	57	0.2	507
3475	Ethanol and gasoline mixture or ethanol and motor spirit mixture or ethanol and petrol mixture, with more than 10% ethanol	1,217	1.7	S	S	S	S	306

S Withheld because estimate did not meet publication standards.
X Not applicable.
Z Rounds to zero.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] UN numbers shown had the highest estimated weight without considering sampling variability. Since an "All other UN numbers" line is not shown, estimates do not add to total.

[3] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table H15.

Hazardous Material Shipment Characteristics by Origin State: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Origin state	Value		Tons		Ton-miles[1]		Average miles per shipment
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
Total	**1,680,231**	**100.0**	**2,967,965**	**100.0**	**382,472**	**100.0**	**189**
Alabama	17,280	1.0	33,651	1.1	5,413	1.4	71
Alaska	5,577	0.3	10,343	0.3	1,733	0.5	61
Arizona	7,232	0.4	10,361	0.3	746	0.2	175
Arkansas	6,447	0.4	8,612	0.3	1,474	0.4	50
California	124,115	7.4	195,201	6.6	13,752	3.6	301
Colorado	10,258	0.6	13,212	0.4	3,846	1.0	204
Connecticut	19,227	1.1	29,481	1.0	947	0.2	47
Delaware	6,670	0.4	9,236	0.3	2,068	0.5	S
District of Columbia	S	S	S	S	S	S	S
Florida	41,136	2.4	68,800	2.3	6,206	1.6	72
Georgia	29,252	1.7	44,850	1.5	2,842	0.7	131
Hawaii	7,261	0.4	16,307	0.5	224	0.1	15
Idaho	3,213	0.2	4,715	0.2	565	0.1	302
Illinois	106,163	6.3	177,294	6.0	17,676	4.6	96
Indiana	35,641	2.1	68,404	2.3	9,820	2.6	300
Iowa	17,460	1.0	30,807	1.0	18,564	4.9	95
Kansas	29,748	1.8	47,313	1.6	2,683	0.7	S
Kentucky	25,802	1.5	45,296	1.5	6,261	1.6	125
Louisiana	132,292	7.9	272,493	9.2	63,022	16.5	124
Maine	6,619	0.4	11,114	0.4	433	0.1	26
Maryland	10,116	0.6	13,553	0.5	567	0.1	190
Massachusetts	34,354	2.0	54,041	1.8	7,284	1.9	130
Michigan	27,397	1.6	44,445	1.5	1,900	0.5	357
Minnesota	30,156	1.8	67,918	2.3	19,410	5.1	268
Mississippi	15,125	0.9	35,013	1.2	9,780	2.6	75
Missouri	17,172	1.0	20,768	0.7	1,519	0.4	112
Montana	8,710	0.5	13,246	0.4	2,338	0.6	63
Nebraska	6,822	0.4	11,700	0.4	4,341	1.1	405
Nevada	4,146	0.2	5,722	0.2	1,812	0.5	110
New Hampshire	5,871	0.3	11,293	0.4	437	0.1	59
New Jersey	34,087	2.0	42,207	1.4	2,082	0.5	164
New Mexico	4,974	0.3	10,799	0.4	4,663	1.2	92
New York	36,144	2.2	54,630	1.8	3,208	0.8	109
North Carolina	19,016	1.1	27,426	0.9	1,860	0.5	103
North Dakota	5,750	0.3	11,683	0.4	1,801	0.5	68
Ohio	48,417	2.9	82,507	2.8	5,519	1.4	125
Oklahoma	22,509	1.3	45,653	1.5	6,033	1.6	87
Oregon	9,453	0.6	14,873	0.5	642	0.2	70
Pennsylvania	38,660	2.3	66,259	2.2	4,153	1.1	60
Rhode Island	3,259	0.2	4,907	0.2	254	0.1	S
South Carolina	8,146	0.5	8,925	0.3	686	0.2	73
South Dakota	4,228	0.3	6,480	0.2	5,603	1.5	S
Tennessee	31,510	1.9	52,290	1.8	5,422	1.4	869
Texas	522,044	31.1	991,307	33.4	116,635	30.5	85
Utah	14,538	0.9	23,152	0.8	S	S	904
Vermont	1,154	0.1	1,999	0.1	76	Z	26
Virginia	12,243	0.7	18,324	0.6	751	0.2	41
Washington	34,871	2.1	63,195	2.1	6,290	1.6	98
West Virginia	11,995	0.7	21,230	0.7	1,748	0.5	152
Wisconsin	20,734	1.2	34,267	1.2	3,435	0.9	227
Wyoming	5,236	0.3	10,662	0.4	1,896	0.5	85

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table H16.

Hazardous Material Shipment Characteristics by Destination State: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

Destination state	Value		Tons		Ton-miles[1]		Average miles per shipment
	2017 (million dollars)	Percent of total	2017 (thousands)	Percent of total	2017 (millions)	Percent of total	
Total	**1,680,231**	**100.0**	**2,967,965**	**100.0**	**382,472**	**100.0**	**189**
Alabama	16,736	1.0	31,671	1.1	3,637	1.0	243
Alaska	6,064	0.4	11,149	0.4	S	S	179
Arizona	8,557	0.5	12,482	0.4	3,335	0.9	524
Arkansas	7,395	0.4	11,460	0.4	2,116	0.6	S
California	125,535	7.5	199,253	6.7	22,581	5.9	397
Colorado	9,830	0.6	14,206	0.5	1,895	0.5	356
Connecticut	20,487	1.2	34,201	1.2	10,630	2.8	109
Delaware	3,544	0.2	3,657	0.1	372	0.1	182
District of Columbia	S	S	209	Z	S	S	S
Florida	55,155	3.3	92,268	3.1	22,535	5.9	353
Georgia	34,058	2.0	52,874	1.8	11,060	2.9	167
Hawaii	7,379	0.4	16,346	0.6	355	0.1	S
Idaho	3,323	0.2	5,441	0.2	1,162	0.3	202
Illinois	92,671	5.5	153,013	5.2	14,181	3.7	101
Indiana	37,019	2.2	66,296	2.2	6,165	1.6	117
Iowa	11,869	0.7	23,477	0.8	5,412	1.4	186
Kansas	29,877	1.8	49,910	1.7	5,599	1.5	S
Kentucky	23,974	1.4	38,775	1.3	3,424	0.9	163
Louisiana	99,759	5.9	210,037	7.1	22,975	6.0	189
Maine	7,782	0.5	13,465	0.5	1,072	0.3	52
Maryland	12,201	0.7	17,198	0.6	2,253	0.6	167
Massachusetts	21,523	1.3	39,755	1.3	1,669	0.4	152
Michigan	33,887	2.0	53,551	1.8	7,952	2.1	190
Minnesota	24,830	1.5	50,489	1.7	4,579	1.2	308
Mississippi	21,011	1.3	39,386	1.3	5,331	1.4	194
Missouri	20,562	1.2	31,105	1.0	3,560	0.9	167
Montana	8,771	0.5	13,276	0.4	2,775	0.7	S
Nebraska	7,098	0.4	12,954	0.4	4,511	1.2	112
Nevada	5,846	0.3	6,864	0.2	2,134	0.6	775
New Hampshire	13,459	0.8	19,021	0.6	951	0.2	100
New Jersey	33,285	2.0	52,508	1.8	12,899	3.4	165
New Mexico	6,087	0.4	11,176	0.4	2,265	0.6	256
New York	40,074	2.4	58,227	2.0	5,946	1.6	222
North Carolina	21,775	1.3	33,371	1.1	7,369	1.9	168
North Dakota	6,059	0.4	12,095	0.4	2,253	0.6	180
Ohio	52,098	3.1	90,649	3.1	12,620	3.3	183
Oklahoma	30,076	1.8	57,052	1.9	9,976	2.6	170
Oregon	13,008	0.8	19,114	0.6	4,009	1.0	528
Pennsylvania	39,090	2.3	69,472	2.3	9,135	2.4	137
Rhode Island	1,777	0.1	2,658	0.1	107	Z	104
South Carolina	13,969	0.8	16,405	0.6	6,370	1.7	105
South Dakota	3,240	0.2	3,782	0.1	316	0.1	S
Tennessee	31,233	1.9	54,718	1.8	9,746	2.5	358
Texas	507,345	30.2	971,103	32.7	93,514	24.4	83
Utah	15,167	0.9	26,494	0.9	S	S	412
Vermont	2,140	0.1	3,601	0.1	385	0.1	82
Virginia	16,367	1.0	24,355	0.8	6,584	1.7	S
Washington	32,757	1.9	60,118	2.0	5,601	1.5	451
West Virginia	14,400	0.9	26,247	0.9	2,825	0.7	210
Wisconsin	24,665	1.5	40,894	1.4	3,447	0.9	176
Wyoming	5,037	0.3	10,137	0.3	1,388	0.4	279

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: Value-of-shipments estimates have not been adjusted for price changes. The "Reliability of Estimates" tables provide estimated measures of sampling variability. The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Reliability of the Estimates for Geographic Area Series

Table B-A1a.

Estimated Measures of Reliability for Shipment Characteristics by Mode of Transportation for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Mode of transportation	Value		Tons		Ton-miles[1]		Average miles per shipment—coefficient of variation of number
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
All modes	**1.0**	**0.0**	**1.3**	**0.0**	**1.8**	**0.0**	**3.4**
Single modes	**1.1**	**0.2**	**1.6**	**0.3**	**1.9**	**0.8**	**4.6**
Truck[2]	1.2	0.3	2.0	0.6	1.5	0.9	4.7
For-hire truck	1.5	0.3	2.7	0.6	1.7	0.7	5.6
Company-owned truck	1.2	0.2	1.6	0.4	1.9	0.2	2.2
Rail	3.9	0.1	5.2	0.5	4.4	0.8	5.5
Water	5.4	0.1	5.4	0.4	7.3	0.5	18.2
Inland water	7.0	0.1	7.7	0.3	6.9	0.3	17.4
Great Lakes	31.0	Z	34.9	0.1	34.8	0.2	6.8
Deep sea	7.8	0.1	10.7	0.2	13.9	0.2	22.2
Multiple waterways	28.8	Z	23.8	Z	21.3	0.1	27.6
Air (includes truck and air)	2.5	0.1	8.0	Z	11.9	Z	1.4
Pipeline[3]	7.8	0.2	7.4	0.4	S	S	S
Multiple modes	**1.5**	**0.2**	**4.4**	**0.3**	**5.0**	**0.8**	**2.7**
Parcel, U.S. Postal Service, or courier	1.8	0.2	2.8	Z	2.5	Z	2.7
Truck and rail	3.4	0.1	6.4	0.3	4.9	0.6	2.3
Truck and water	2.8	0.1	7.1	0.1	5.1	0.1	10.9
Rail and water	17.5	0.1	8.8	0.1	13.0	0.4	9.7
Other multiple modes	8.7	Z	16.0	Z	13.6	Z	6.9
Other modes	**14.7**	**Z**	**22.8**	**0.2**	**15.2**	**Z**	**40.8**

S Withheld because estimate did not meet publication standards.
Z Rounds to zero.
[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[2] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.
[3] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-A1b.

Estimated Measures of Reliability for Shipment Characteristics by Mode of Transportation for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

Mode of transportation	Value			Tons			Ton-miles[1]			Average miles per shipment		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012		2017	2012		2017	2012	
All modes	**1.0**	**1.1**	**1.5**	**1.3**	**1.8**	**2.5**	**1.8**	**3.7**	**4.3**	**3.4**	**3.4**	**5.2**
Single modes	**1.1**	**1.2**	**1.6**	**1.6**	**1.8**	**2.6**	**1.9**	**4.4**	**4.4**	**4.6**	**3.5**	**5.4**
Truck[2]	1.2	1.1	1.7	2.0	1.5	2.8	1.5	1.6	2.3	4.7	4.1	5.7
For-hire truck	1.5	0.8	1.8	2.7	2.1	4.2	1.7	1.6	2.6	5.6	4.3	5.1
Company-owned truck	1.2	1.8	2.1	1.6	1.4	2.0	1.9	3.4	3.3	2.2	16.4	13.0
Rail	3.9	5.4	3.6	5.2	8.0	7.3	4.4	9.1	6.9	5.5	2.7	4.4
Water	5.4	16.5	14.1	5.4	13.2	20.0	7.3	14.9	22.3	18.2	12.9	6.4
Inland water	7.0	19.9	11.3	7.7	16.4	20.2	6.9	17.3	27.9	17.4	21.3	18.8
Great Lakes	31.0	25.0	57.6	34.9	19.5	53.4	34.8	23.3	59.7	6.8	7.9	9.2
Deep sea	7.8	23.5	49.9	10.7	25.2	100.9	13.9	30.1	76.2	22.2	10.4	7.6
Multiple waterways	28.8	32.9	10.3	23.8	25.8	16.4	21.3	22.9	11.9	27.6	10.5	15.0
Air (includes truck and air)	2.5	4.5	5.6	8.0	7.2	17.9	11.9	13.4	30.3	1.4	8.8	9.7
Pipeline[3]	7.8	9.3	7.7	7.4	11.0	14.6	S	S	S	S	S	S
Multiple modes	**1.5**	**1.3**	**2.8**	**4.4**	**7.0**	**17.9**	**5.0**	**7.1**	**20.5**	**2.7**	**2.6**	**3.9**
Parcel, U.S. Postal Service, or courier	1.8	1.4	2.9	2.8	3.0	5.4	2.5	2.6	4.8	2.7	2.6	3.9
Truck and rail	3.4	5.5	9.9	6.4	7.2	21.2	4.9	5.7	19.7	2.3	6.0	7.7
Truck and water	2.8	15.4	135.2	7.1	22.7	46.0	5.1	38.5	41.4	10.9	7.3	6.6
Rail and water	17.5	13.0	119.2	8.8	20.1	56.5	13.0	26.2	102.9	9.7	25.6	27.4
Other multiple modes	8.7	33.3	901.3	16.0	36.6	133.8	13.6	32.2	180.3	6.9	S	S
Other modes	**14.7**	**31.8**	**71.6**	**22.8**	**18.1**	**73.9**	**15.2**	**22.7**	**13.6**	**40.8**	**S**	**S**

S Withheld because estimate did not meet publication standards.
[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[2] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.
[3] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-A2a.

Estimated Measures of Reliability for Shipment Characteristics by Total Modal Activity for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Mode of transportation[1]	Ton-miles[2]		Average miles per shipment—coefficient of variation of number
	Coefficient of variation of number	Standard error of percent of total	
Total	**1.8**	**0.0**	**3.4**
Truck[3]	1.5	0.9	4.7
Rail	2.9	0.6	3.2
Inland water	8.4	0.5	15.1
Great Lakes	29.4	0.4	10.1
Deep sea	9.3	0.2	11.7
Air	11.8	Z	3.8
Pipeline[4]	S	S	S
Parcel, U.S. Postal Service, or courier	2.5	Z	2.7
Other modes	15.2	Z	40.8

S Withheld because estimate did not meet publication standards.
Z Rounds to zero.
[1] Estimates represent activity for a given mode across single and multiple mode shipments. For example, "Truck" ton-miles includes total ton-miles for shipments moving only by truck plus ton-miles for truck segments of multiple mode shipments.
[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[3] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.
[4] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-A2b.

Estimated Measures of Reliability for Shipment Characteristics by Total Modal Activity for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

Mode of transportation[1]	Ton-miles[2]			Average miles per shipment		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012	
Total	**1.8**	**3.7**	**4.3**	**3.4**	**3.2**	**5.0**
Truck[3]	1.5	1.6	2.4	4.7	4.1	5.7
Rail	2.9	8.1	8.2	3.2	3.6	5.2
Inland water	8.4	14.6	20.8	15.1	15.2	23.9
Great Lakes	29.4	26.1	48.3	10.1	13.7	19.9
Deep sea	9.3	23.7	30.5	11.7	7.5	1.1
Air	11.8	15.0	44.3	3.8	13.4	15.6
Pipeline[4]	S	S	S	S	S	S
Parcel, U.S. Postal Service, or courier	2.5	2.5	4.7	2.7	2.7	3.9
Other modes	15.2	22.7	13.6	40.8	S	S

S Withheld because estimate did not meet publication standards.
[1] Estimates represent activity for a given mode across single and multiple mode shipments. For example, "Truck" ton-miles includes total ton-miles for shipments moving only by truck plus ton-miles for truck segments of multiple mode shipments.
[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[3] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.
[4] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-A3a.

Estimated Measures of Reliability for Shipment Characteristics by Distance Shipped for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Distance shipped[1] (Based on Great Circle Distance)	Value		Tons		Ton-miles[2]	
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
Total	**1.0**	**0.0**	**1.3**	**0.0**	**1.8**	**0.0**
Less than 50 miles	1.3	0.2	2.2	0.7	3.2	0.1
50 to 99 miles	2.7	0.2	3.1	0.3	2.7	0.1
100 to 249 miles	1.7	0.1	2.1	0.3	2.7	0.3
250 to 499 miles	0.6	0.1	1.5	0.2	1.5	0.4
500 to 749 miles	1.2	0.1	3.3	0.2	3.6	0.4
750 to 999 miles	1.5	0.1	4.7	0.1	5.0	0.6
1,000 to 1,499 miles	1.1	0.1	5.2	0.2	4.9	0.8
1,500 to 1,999 miles	1.5	0.1	2.7	Z	2.8	0.3
2,000 miles or more	2.1	0.1	7.8	Z	7.1	0.3

Z Rounds to zero.
[1] Shipments are grouped into distance categories based on Great Circle Distance (GCD). GCD is the shortest distance between two points on the surface of a sphere over the surface of that sphere.
[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-A3b.

Estimated Measures of Reliability for Shipment Characteristics by Distance Shipped for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

Distance shipped[1] (Based on Great Circle Distance)	Value			Tons			Ton-miles[2]		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012		2017	2012	
Total	**1.0**	**1.1**	**1.5**	**1.3**	**1.8**	**2.5**	**1.8**	**3.7**	**4.3**
Less than 50 miles	1.3	2.0	2.5	2.2	2.2	3.6	3.2	2.4	5.1
50 to 99 miles	2.7	2.2	3.7	3.1	2.8	4.7	2.7	3.1	4.8
100 to 249 miles	1.7	1.8	2.6	2.1	3.2	4.0	2.7	3.6	4.9
250 to 499 miles	0.6	1.2	1.4	1.5	4.1	4.4	1.5	4.0	4.4
500 to 749 miles	1.2	1.7	2.1	3.3	4.4	5.7	3.6	4.9	6.4
750 to 999 miles	1.5	1.9	2.5	4.7	8.4	9.0	5.0	8.3	9.3
1,000 to 1,499 miles	1.1	2.5	2.8	5.2	6.9	9.3	4.9	6.8	9.3
1,500 to 1,999 miles	1.5	4.0	5.0	2.7	5.4	5.6	2.8	7.4	7.0
2,000 miles or more	2.1	3.5	4.7	7.8	4.3	10.1	7.1	4.2	9.2

[1] Shipments are grouped into distance categories based on Great Circle Distance (GCD). GCD is the shortest distance between two points on the surface of a sphere over the surface of that sphere.
[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-A4a.

Estimated Measures of Reliability for Shipment Characteristics by Shipment Weight for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Shipment weight	Value		Tons		Ton-miles[1]		Average miles per shipment—coefficient of variation of number
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
Total	**1.0**	**0.0**	**1.3**	**0.0**	**1.8**	**0.0**	**3.4**
Less than 50 lbs	1.5	0.1	1.1	Z	2.3	Z	3.4
50 to 99 lbs	2.7	0.1	1.7	Z	2.5	Z	2.8
100 to 499 lbs	1.4	0.1	1.8	Z	2.4	Z	3.6
500 to 749 lbs	1.8	0.1	2.8	Z	1.6	Z	2.3
750 to 999 lbs	2.2	0.1	2.1	Z	2.0	Z	3.5
1,000 to 9,999 lbs	1.7	0.4	1.1	0.1	1.1	0.1	1.8
10,000 to 49,999 lbs	1.6	0.3	2.4	0.6	2.1	0.5	1.8
50,000 to 99,999 lbs	3.5	0.2	2.7	0.4	4.9	0.4	6.2
100,000 lbs or more	3.0	0.2	2.1	0.7	3.0	0.7	3.6

Z Rounds to zero.
[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-A4b.

Estimated Measures of Reliability for Shipment Characteristics by Shipment Weight for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

Shipment weight	Value			Tons			Ton-miles[1]			Average miles per shipment		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012		2017	2012		2017	2012	
Total	**1.0**	**1.1**	**1.5**	**1.3**	**1.8**	**2.5**	**1.8**	**3.7**	**4.3**	**3.4**	**3.4**	**5.2**
Less than 50 lbs	1.5	1.5	2.9	1.1	4.0	5.5	2.3	4.0	6.2	3.4	3.4	5.1
50 to 99 lbs	2.7	2.8	4.7	1.7	2.3	4.0	2.5	2.7	4.5	2.8	2.4	3.3
100 to 499 lbs	1.4	1.7	2.6	1.8	1.7	3.2	2.4	2.5	3.9	3.6	2.3	3.7
500 to 749 lbs	1.8	2.3	3.2	2.8	1.7	4.1	1.6	2.1	2.9	2.3	1.9	2.6
750 to 999 lbs	2.2	3.5	4.4	2.1	2.3	4.0	2.0	2.6	3.7	3.5	1.9	3.6
1,000 to 9,999 lbs	1.7	1.7	2.8	1.1	2.3	3.0	1.1	2.0	2.6	1.8	1.8	2.4
10,000 to 49,999 lbs	1.6	1.3	2.1	2.4	1.6	3.3	2.1	1.9	3.2	1.8	1.7	2.5
50,000 to 99,999 lbs	3.5	4.3	4.7	2.7	2.9	5.0	4.9	3.3	8.5	6.2	2.5	7.5
100,000 lbs or more	3.0	4.4	3.8	2.1	4.5	4.6	3.0	6.1	6.4	3.6	3.1	5.4

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-A5a.

Estimated Measures of Reliability for Shipment Characteristics by Two-Digit Commodity for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

SCTG code	Commodity description	Value		Tons		Ton-miles[1]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
	All commodities[2]	**1.0**	**0.0**	**1.3**	**0.0**	**1.8**	**0.0**	**3.4**
01	Live animals and live fish	29.9	Z	32.4	Z	26.5	Z	12.3
02	Cereal grains (includes seed)	2.5	Z	1.8	0.1	8.2	0.5	17.8
03	Agricultural products (excludes animal feed, cereal grains, and forage products)	4.8	0.1	4.4	0.1	7.4	0.3	11.1
04	Animal feed, eggs, honey, and other products of animal origin	2.9	Z	5.9	0.1	6.4	0.2	19.6
05	Meat, poultry, fish, seafood, and their preparations	2.1	0.1	2.3	Z	4.6	0.1	17.6
06	Milled grain products and preparations and bakery products	3.2	Z	5.8	0.1	7.2	0.1	16.8
07	Other prepared foodstuffs and fats and oils	1.7	0.1	3.1	0.1	2.7	0.2	12.0
08	Alcoholic beverages, and denatured alcohol	2.4	Z	3.3	Z	7.9	0.1	17.1
09	Tobacco products	15.6	0.1	24.9	Z	15.8	Z	9.1
10	Monumental or building stone	12.7	Z	14.6	Z	12.1	Z	18.5
11	Natural sands	14.0	Z	6.9	0.3	14.0	0.4	20.6
12	Gravel and crushed stone (excludes dolomite and slate)	7.2	Z	7.2	0.8	12.3	0.3	8.3
13	Other nonmetallic minerals, n.e.c.	6.6	Z	12.4	0.2	8.8	0.2	14.5
14	Metallic ores and concentrates	9.8	Z	19.4	0.1	37.1	0.5	13.0
15	Coal	4.4	Z	5.2	0.4	6.7	0.7	20.7
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	5.4	0.3	6.1	0.7	7.4	0.4	10.6
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	4.5	0.1	4.2	0.3	11.8	0.3	10.6
19	Other coal and petroleum products, n.e.c.	6.2	0.1	5.0	0.2	10.1	0.3	9.9
20	Basic chemicals	2.6	0.1	5.1	0.2	6.2	0.3	17.9
21	Pharmaceutical products	5.9	0.4	10.8	Z	16.7	0.1	6.4
22	Fertilizers	4.9	Z	5.7	0.1	7.6	0.1	13.4
23	Chemical products and preparations, n.e.c.	4.7	0.1	5.8	0.1	6.3	0.1	6.7
24	Plastics and rubber	1.7	0.1	3.8	0.1	3.5	0.2	16.4
25	Logs and other wood in the rough	14.8	Z	14.9	Z	15.2	Z	16.6
26	Wood products	1.3	Z	1.7	0.1	2.7	0.1	14.9
27	Pulp, newsprint, paper, and paperboard	5.0	Z	7.2	0.1	13.8	0.4	7.0
28	Paper or paperboard articles	3.3	Z	4.5	Z	6.0	0.1	10.0
29	Printed products	5.5	0.1	6.5	Z	4.4	Z	12.9
30	Textiles, leather, and articles of textiles or leather	2.3	0.1	5.0	Z	3.3	Z	3.4
31	Nonmetallic mineral products	2.5	Z	3.1	0.1	6.5	0.2	11.8
32	Base metal in primary or semifinished forms and in finished basic shapes	1.9	0.1	2.9	0.1	3.1	0.1	8.3
33	Articles of base metal	2.8	0.1	5.7	Z	9.1	0.1	6.3
34	Machinery	1.2	0.1	3.7	Z	4.8	0.1	3.3
35	Electronic and other electrical equipment and components and office equipment	2.0	0.2	2.6	Z	4.7	0.1	7.7
36	Motorized and other vehicles (including parts)	3.9	0.3	7.9	0.1	5.7	0.1	4.5
37	Transportation equipment, n.e.c.	3.4	0.1	14.4	Z	17.0	Z	6.0
38	Precision instruments and apparatus	3.4	0.1	13.5	Z	15.1	Z	4.7
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	5.7	0.1	4.0	Z	5.0	Z	4.6
40	Miscellaneous manufactured products	2.6	0.1	8.2	Z	5.7	0.1	3.4
41	Waste and scrap	4.6	Z	4.9	0.1	4.8	0.1	7.2
43	Mixed freight	3.5	0.3	3.1	0.1	2.6	0.1	5.3
99	Commodity unkown	X	X	X	X	X	X	X

X Not applicable.
Z Rounds to zero.
[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[2] Estimates exclude shipments of crude petroleum (SCTG 16).
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-A5b.

Estimated Measures of Reliability for Shipment Characteristics by Two-Digit Commodity for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

SCTG code	Commodity description	Value			Tons			Ton-miles[1]			Average miles per shipment		
		Coefficient of variation of number			Coefficient of variation of number			Coefficient of variation of number			Coefficient of variation of number		
		2017	2012	Standard error of percent change	2017	2012	Standard error of percent change	2017	2012	Standard error of percent change	2017	2012	Standard error of percent change
	All commodities[2]	**1.0**	**1.1**	**1.5**	**1.3**	**1.8**	**2.5**	**1.8**	**3.7**	**4.3**	**3.4**	**3.4**	**5.2**
01	Live animals and live fish	29.9	24.6	65.2	32.4	24.7	83.4	26.5	22.2	36.8	12.3	19.2	35.0
02	Cereal grains (includes seed)	2.5	9.7	8.3	1.8	10.3	15.5	8.2	20.9	28.0	17.8	13.0	17.2
03	Agricultural products (excludes animal feed, cereal grains, and forage products)	4.8	5.4	8.6	4.4	4.9	9.4	7.4	10.6	17.6	11.1	15.9	20.1
04	Animal feed, eggs, honey, and other products of animal origin	2.9	5.9	7.4	5.9	6.5	12.0	6.4	6.1	11.7	19.6	18.0	19.3
05	Meat, poultry, fish, seafood, and their preparations	2.1	3.3	4.6	2.3	3.3	4.2	4.6	4.1	6.5	17.6	8.8	19.5
06	Milled grain products and preparations and bakery products	3.2	5.2	7.9	5.8	6.8	10.3	7.2	9.6	12.6	16.8	25.3	33.6
07	Other prepared foodstuffs and fats and oils	1.7	3.6	4.1	3.1	3.5	4.7	2.7	7.9	8.4	12.0	18.5	18.3
08	Alcoholic beverages, and denatured alcohol	2.4	1.6	3.7	3.3	2.9	4.9	7.9	4.3	7.1	17.1	20.3	63.9
09	Tobacco products	15.6	15.0	25.7	24.9	13.1	45.0	15.8	15.6	30.0	9.1	19.7	26.5
10	Monumental or building stone	12.7	17.0	36.2	14.6	11.3	22.8	12.1	10.4	24.5	18.5	11.7	56.1
11	Natural sands	14.0	10.3	27.2	6.9	14.0	19.0	14.0	10.3	50.6	20.6	12.7	80.3
12	Gravel and crushed stone (excludes dolomite and slate)	7.2	2.7	8.6	7.2	2.9	8.1	12.3	6.5	16.2	8.3	7.7	15.4
13	Other nonmetallic minerals, n.e.c.	6.6	8.2	19.0	12.4	8.4	22.4	8.8	6.4	17.5	14.5	17.9	24.9
14	Metallic ores and concentrates	9.8	9.5	14.4	19.4	21.9	21.8	37.1	26.5	41.9	13.0	21.3	38.2
15	Coal	4.4	5.5	5.5	5.2	7.2	7.4	6.7	13.6	11.0	20.7	4.8	17.9
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	5.4	4.3	4.4	6.1	4.2	8.2	7.4	9.5	17.1	10.6	10.2	14.2
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	4.5	7.7	6.0	4.2	9.7	11.4	11.8	27.2	39.7	10.6	8.9	16.2
19	Other coal and petroleum products, n.e.c.	6.2	6.0	5.7	5.0	8.9	10.6	10.1	20.3	20.1	9.9	9.7	9.1
20	Basic chemicals	2.6	5.2	5.4	5.1	3.4	7.5	6.2	5.3	8.6	17.9	18.0	16.2
21	Pharmaceutical products	5.9	2.5	8.6	10.8	7.2	15.6	16.7	8.5	24.3	6.4	12.2	13.1
22	Fertilizers	4.9	6.6	5.7	5.7	15.6	14.8	7.6	12.2	9.4	13.4	11.4	12.6
23	Chemical products and preparations, n.e.c.	4.7	6.5	9.9	5.8	6.7	10.7	6.3	5.5	10.8	6.7	4.6	10.7
24	Plastics and rubber	1.7	3.4	4.4	3.8	5.6	8.3	3.5	6.3	8.9	16.4	11.0	19.5
25	Logs and other wood in the rough	14.8	17.0	32.4	14.9	25.1	21.3	15.2	20.2	35.2	16.6	29.4	25.2
26	Wood products	1.3	2.6	4.4	1.7	7.2	8.0	2.7	6.9	8.0	14.9	6.1	18.8
27	Pulp, newsprint, paper, and paperboard	5.0	3.2	6.1	7.2	4.5	9.6	13.8	3.8	17.2	7.0	13.8	15.8
28	Paper or paperboard articles	3.3	2.5	4.9	4.5	3.5	6.1	6.0	3.6	6.9	10.0	11.0	13.5
29	Printed products	5.5	4.3	5.9	6.5	8.0	7.4	4.4	9.2	7.6	12.9	17.1	20.3
30	Textiles, leather, and articles of textiles or leather	2.3	8.8	10.0	5.0	8.0	9.4	3.3	11.0	11.0	3.4	2.3	4.1
31	Nonmetallic mineral products	2.5	2.2	3.7	3.1	3.5	5.4	6.5	2.5	7.8	11.8	8.0	18.7
32	Base metal in primary or semifinished forms and in finished basic shapes	1.9	2.2	3.0	2.9	3.1	4.6	3.1	2.8	4.3	8.3	6.0	13.2
33	Articles of base metal	2.8	2.5	4.2	5.7	3.1	8.3	9.1	2.9	11.2	6.3	4.4	8.1
34	Machinery	1.2	2.8	3.5	3.7	9.5	12.9	4.8	6.0	8.9	3.3	4.7	5.8
35	Electronic and other electrical equipment and components and office equipment	2.0	3.4	4.3	2.6	3.8	5.6	4.7	4.0	6.7	7.7	4.8	8.5
36	Motorized and other vehicles (including parts)	3.9	2.4	5.5	7.9	4.5	11.9	5.7	7.9	10.0	4.5	8.9	9.9
37	Transportation equipment, n.e.c.	3.4	6.4	7.3	14.4	9.3	14.9	17.0	11.6	18.0	6.0	4.9	8.4
38	Precision instruments and apparatus	3.4	3.1	5.1	13.5	18.6	24.4	15.1	8.7	18.0	4.7	3.0	5.3
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	5.7	10.8	13.6	4.0	12.1	12.5	5.0	6.7	9.2	4.6	7.8	8.9
40	Miscellaneous manufactured products	2.6	3.7	5.3	8.2	10.9	15.0	5.7	6.0	9.3	3.4	3.3	4.8
41	Waste and scrap	4.6	9.2	6.8	4.9	8.1	9.3	4.8	17.5	14.2	7.2	9.2	10.0
43	Mixed freight	3.5	3.4	5.2	3.1	3.3	4.9	2.6	4.7	5.7	5.3	9.5	10.1
99	Commodity unknown	X	37.9	X	X	33.0	X	X	28.0	X	X	19.4	X

X Not applicable.
[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[2] Estimates exclude shipments of crude petroleum (SCTG 16).
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-A6.

Estimated Measures of Reliability for Shipment Characteristics by Three-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

SCTG code	Commodity description	Value		Tons		Ton-miles[1]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
	All commodities[2]	**1.0**	**0.0**	**1.3**	**0.0**	**1.8**	**0.0**	**3.4**
010	Live animals and live fish	29.9	Z	32.4	Z	26.5	Z	12.3
021	Wheat	6.2	Z	6.7	0.1	17.9	0.3	24.1
022	Corn, except sweet	4.6	Z	4.2	0.2	11.4	0.5	9.1
029	Other cereal grains	11.6	Z	11.8	Z	21.0	0.1	20.6
031	Fresh or chilled potatoes, except sweet	17.6	Z	15.0	Z	21.2	Z	34.1
032	Fresh or chilled edible vegetables (except potatoes), and dried vegetables	6.7	Z	9.6	0.1	14.3	0.2	17.8
033	Fruit and nuts, edible, fresh, chilled, or dried	10.1	Z	19.5	0.1	20.2	0.1	21.3
034	Soy beans	5.2	Z	5.1	0.1	7.7	0.2	11.5
035	Oil seeds and nuts, except olives and soy beans	12.7	Z	14.3	Z	14.7	Z	16.7
036	Bulbs, live plants, and seeds for sowing, n.e.c.	12.8	Z	42.8	Z	39.6	0.1	12.2
039	Fresh-cut flowers, plants, and parts of plants, and other agricultural products	14.7	Z	19.2	Z	18.8	Z	19.8
041	Eggs, cereal straw or husks, forage products, residues and waste from the food industries used in animal feeding, other products of animal origin, n.e.c.	5.6	Z	5.2	0.1	7.7	0.1	18.8
042	Animal feed preparations	4.3	Z	9.8	0.1	8.0	0.1	16.8
051	Meat and poultry, fresh, chilled, or frozen, meat in brine, dried or smoked	1.9	Z	2.3	Z	4.0	0.1	22.1
052	Fish (except live), seafood, and their preparations	6.0	Z	8.7	Z	12.0	Z	33.0
053	Preparations, extracts, and juices of meat, fish, or seafood	14.4	Z	21.9	Z	20.6	Z	22.3
061	Wheat flour, groats, and meal	6.1	Z	15.3	Z	12.4	Z	24.7
062	Malt, milled rice and corn (broken, flour, groats, and meal, inulin, wheat gluten, milled cereals and other vegetables and grains)	9.9	Z	13.4	Z	15.8	0.1	29.8
063	Bakery products and food preparations of cereals, flour, starch or milk	8.0	Z	7.9	Z	7.9	Z	30.7
064	Bakery products, including frozen	3.8	Z	4.7	Z	10.3	Z	26.2
071	Dairy products except beverages and preparations of milk	4.2	Z	4.8	Z	5.3	Z	6.8
072	Processed or prepared vegetables, fruit, or nuts, except dried or milled, and juices	6.9	Z	8.4	Z	8.7	0.1	20.8
073	Coffee, tea, and spices, except unprocessed coffee and unfermented tea	6.7	Z	8.2	Z	8.7	Z	17.5
074	Animal or vegetable fats, oils, waxes, and their cleavage products, prepared edible fats, and flours and meals of oil seeds (excludes oils and fats for use as biodiesel)	7.9	Z	6.9	Z	9.5	0.1	21.3
075	Sugars confectionery, solid or syrups not containing added flavoring or coloring	7.7	Z	9.6	Z	10.9	0.1	11.2
076	Confectionery, cocoa, and cocoa preparations	6.9	Z	8.2	Z	8.0	Z	10.1
077	Edible preparations, n.e.c., and vinegar	6.0	Z	8.5	Z	14.7	0.1	10.3
078	Nonalcoholic beverages, n.e.c., and ice	4.6	Z	6.4	0.1	7.2	0.1	37.2
081	Malt beer	4.2	Z	4.8	Z	9.7	Z	3.7
082	Wine and other fermented beverages	7.1	Z	8.0	Z	21.1	0.1	16.1
083	Spirituous beverages and undenatured ethyl alcohol	5.2	Z	7.4	Z	16.8	Z	29.8
084	Denatured ethyl alcohol, not for ingestion or use as biofuel	13.3	Z	16.0	Z	31.8	Z	16.5
090	Tobacco products	15.6	0.1	24.9	Z	15.8	Z	9.1
100	Monumental or building stone, except dolomite	12.7	Z	14.6	Z	12.1	Z	18.5
110	Natural sands, except metal-bearing	14.0	Z	6.9	0.3	14.0	0.4	20.6
120	Gravel and crushed stone, except dolomite and slate	7.2	Z	7.2	0.8	12.3	0.3	8.3
131	Salt	13.0	Z	16.0	0.1	13.8	0.1	10.7
132	Natural calcium phosphates, natural aluminum-calcium phosphates, and phosphatic chalk	21.2	Z	33.3	Z	21.7	Z	27.8
133	Dolomite, including monumental, building, and crushed	28.1	Z	39.7	0.2	41.0	0.1	20.1
139	Other nonmetallic minerals, n.e.c.	7.8	Z	8.8	0.1	12.3	0.1	12.4
141	Iron ores and concentrates	22.1	Z	23.1	0.1	41.5	0.5	S
149	Metallic ores and concentrates, except iron	13.6	Z	31.3	Z	20.6	Z	13.2
151	Nonagglomerated bituminous coal	4.8	Z	5.0	0.3	6.7	0.7	30.5
159	Coal, except nonagglomerated bituminous coal	23.2	Z	21.5	0.2	18.1	Z	S
171	Gasoline, and blends of gasoline and 10 percent ethanol	5.5	0.2	6.1	0.6	9.4	0.3	12.7
172	Aviation turbine fuel (types a and b), and kerosene	13.6	Z	13.4	0.1	23.6	0.1	15.8
175	Ethanol, ethanol blends of more than 10 percent ethanol, and other fuel alcohols	24.1	Z	25.0	Z	32.5	0.1	S
176	Ethanol, for use as biofuels	5.2	Z	4.8	Z	7.6	0.1	21.8
181	Fuel oils	4.3	0.1	3.8	0.3	13.8	0.3	12.1
182	Blends of fuel oils and biofuel, biodiesel	11.5	0.1	12.6	0.2	32.0	0.2	10.5
191	Lubricating oils and greases	7.1	0.1	10.9	0.1	18.5	0.1	9.1
192	Refined petroleum oils and oils obtained from bituminous minerals, n.e.c.	13.4	Z	12.7	0.1	34.2	0.2	14.3
193	Gaseous hydrocarbons	18.5	0.1	13.5	0.1	13.6	Z	11.8
199	Other products of petroleum refining, and coal products, n.e.c.	6.8	Z	4.0	0.1	10.1	0.1	4.6
201	Sodium hydroxide (caustic soda) and potassium hydroxide (caustic potash)	13.3	Z	14.9	Z	20.8	0.1	10.8
202	Inorganic chemicals, n.e.c.	5.6	Z	8.1	0.2	10.3	0.3	9.7
203	Cyclic hydrocarbons	20.0	Z	21.7	0.1	41.1	0.1	8.1
204	Phenols, phenol-alcohols, aldehydes, cyclic polymers of aldehydes, and acyclic alcohols, and organic acids	6.9	Z	8.0	Z	14.4	0.1	10.2

See footnotes at end of table.

Table B-A6.

Estimated Measures of Reliability for Shipment Characteristics by Three-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

SCTG code	Commodity description	Value		Tons		Ton-miles[1]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
205	Organic chemicals, n.e.c.	3.2	Z	5.2	Z	4.0	Z	20.5
210	Pharmaceutical products	5.9	0.4	10.8	Z	16.7	0.1	6.4
220	Fertilizers and fertilizer materials	4.9	Z	5.7	0.1	7.6	0.1	13.4
231	Paints and varnishes, enamels, tanning or dyeing extracts, tannins and their derivatives, inks, lakes, toners, and ink	4.4	Z	8.7	Z	7.6	Z	17.9
232	Essential oils and resinoids, and perfumery, cosmetic, or toilet preparations	12.0	0.1	8.6	Z	9.0	Z	7.4
233	Soap, organic surface-active agents, cleaning preparations, polishes and creams, and scouring preps	10.0	Z	12.7	Z	13.3	0.1	10.6
234	Photographic film, plates, paper, paperboard, or textiles, and chemical preps for photographic use	11.2	Z	20.3	Z	27.5	Z	13.0
235	Insecticides, rodenticides, fungicides, herbicides, disinfectants, etc.	6.9	Z	10.1	Z	12.0	Z	15.3
239	Other chemical products and preparations: glues, prepared explosives, activated natural mineral products, anti-knock preparations, etc.	6.0	Z	8.9	Z	11.2	0.1	8.9
241	Plastics and rubber in primary forms or sheets	3.9	Z	4.2	Z	6.5	0.1	8.9
242	Manmade fibers and plastics basic shapes and articles	2.8	Z	8.9	0.1	8.3	0.1	15.2
243	Rubber articles	4.5	Z	8.1	Z	13.7	0.1	14.9
250	Logs and other wood in the rough	14.8	Z	14.9	Z	15.2	Z	16.6
261	Wood chips or particles	9.9	Z	7.3	Z	14.3	Z	12.4
262	Lumber, wood continuously shaped along any of its edges or faces, shingles and shakes	2.6	Z	3.0	Z	3.1	Z	22.5
263	Veneer sheets and sheets for plywood, particle board, fiberboard, plywood, and similar laminated wood	3.7	Z	4.7	Z	6.9	Z	18.6
264	Windows, doors, thresholds, and builders' joinery and carpentry of wood, except shingles and shakes	5.5	Z	12.1	Z	8.2	Z	13.9
269	Other wood products	5.1	Z	9.0	Z	7.8	Z	12.5
271	Pulp of fibrous cellulosic materials	6.7	Z	8.6	Z	8.8	Z	13.1
272	Newsprint in large rolls or sheets	14.0	Z	12.4	Z	11.7	Z	7.3
273	Uncoated paper, tissue, and paperboard in large rolls or sheets	6.7	Z	8.4	0.1	10.1	0.1	9.8
274	Coated, impregnated, treated, or worked paper and paperboard, in large rolls or sheets	6.3	Z	12.6	Z	26.2	0.3	13.8
280	Paper or paperboard articles	3.3	Z	4.5	Z	6.0	0.1	10.0
291	Printed books, brochures, leaflets, and similar printed products	8.9	Z	8.3	Z	7.1	Z	4.3
292	Newspapers, journals, and periodicals	20.7	Z	16.0	Z	20.8	Z	40.1
293	Advertising material, commercial or trade catalogues, and similar printed products	3.2	Z	5.5	Z	8.9	Z	10.6
299	Other printed products	5.4	Z	8.8	Z	3.6	Z	6.2
301	Textile fibers, yarns, and broad woven or knitted fabrics	9.6	Z	9.4	Z	14.4	Z	3.4
302	Textile clothing and accessories, and headgear, except safety	3.2	0.1	12.5	Z	6.2	Z	4.1
303	Textiles and textile articles, n.e.c.	2.7	Z	5.3	Z	5.8	Z	7.0
304	Leather footwear	7.3	Z	7.4	Z	6.1	Z	4.1
305	Leather and articles of leather or allied materials, and dressed fur skins	11.6	Z	24.7	Z	13.1	Z	6.5
311	Hydraulic cements	8.4	Z	9.2	0.1	12.7	Z	10.2
312	Ceramic products	7.5	Z	19.5	Z	7.4	Z	4.1
313	Glass and glass products	7.3	Z	5.6	Z	7.3	Z	11.8
319	Other nonmetallic mineral products	1.7	Z	3.4	0.1	8.9	0.2	10.5
321	Ferro-alloys, and iron and steel in primary or semi-finished forms, or in powders or granules	8.9	Z	15.9	Z	16.5	0.1	24.7
322	Flat-rolled products of iron or steel	4.6	0.1	6.3	0.1	7.0	0.1	4.4
323	Bars, rods, angles, shapes, sections, and wire, of iron or steel	3.3	Z	5.5	Z	5.1	Z	16.5
324	Nonferrous metal, except precious, unwrought, or in finished basic shapes, or in powders orgranules	3.6	Z	4.6	Z	7.3	0.1	9.2
331	Pipes, tubes, and fittings	6.9	0.1	11.1	Z	20.6	0.1	7.0
332	Structures and parts, except prefabricated buildings	6.7	Z	6.6	Z	4.7	Z	12.5
333	Hand tools, cutlery, except of precious metals, interchangeable tools for hand or machine tools,hardware, and industrial fasteners	3.9	Z	13.4	Z	6.1	Z	7.5
339	Other articles of metal	7.1	0.1	8.3	Z	9.6	Z	5.2
341	Internal-combustion engines and parts	6.3	0.1	15.3	Z	21.3	Z	9.2
342	Turbines, boilers, nuclear reactors, and nonelectric engines and motors, except internal-combustion	8.8	Z	12.1	Z	19.1	Z	9.5
343	Pumps, compressors, fans, and ventilating or recycling hoods incorporating a fan	6.5	Z	26.5	Z	36.8	0.1	7.2
344	Air-conditioning, refrigerating, or freezing equipment	4.4	Z	16.3	Z	6.5	Z	9.7
345	Materials-handling, excavating, boring, and related machinery and equipment	4.7	0.1	8.7	Z	7.7	Z	8.0
349	Other mechanical machinery, n.e.c	1.4	Z	8.0	Z	8.6	Z	4.2
351	Electric motors, generators, rotary or static converters, and transformers	8.6	Z	11.9	Z	21.7	Z	8.1
352	Electric cooking appliances, electro-thermic, or electro-mechanical domestic appliances	8.4	Z	10.6	Z	10.6	Z	4.3
353	Line telephone or telegraph apparatus	8.5	Z	32.3	Z	26.9	Z	5.2
354	Electronic entertainment products, except parts	6.8	Z	18.3	Z	7.5	Z	5.7

Seet footnotes at end of table.

Table B-A6.

Estimated Measures of Reliability for Shipment Characteristics by Three-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

SCTG code	Commodity description	Value		Tons		Ton-miles[1]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
355	Computer and electronic office equipment	7.7	0.1	18.9	Z	8.8	Z	6.5
356	Prepared unrecorded or prerecorded media	14.0	Z	31.6	Z	28.7	Z	38.6
357	Transmission, and reception apparatus for radio, television, radar, and remote-control	10.3	Z	33.5	Z	13.9	Z	8.2
358	Electronic components and parts	5.9	0.1	14.8	Z	19.5	Z	6.6
359	Other electronic and electrical equipment, n.e.c	2.8	0.1	2.8	Z	4.5	Z	12.1
361	Motroized vehicles for transport of less than 10 people, except motorcycles, armored, and recreational	6.7	0.2	7.6	Z	8.3	Z	13.4
362	Motor vehicles for the transport of good, and road tractors for semi-trailers	12.0	0.1	18.7	Z	15.4	Z	35.3
363	Other vehicles	12.7	0.2	17.8	Z	10.5	Z	7.7
364	Motor vehicles parts and accessories except motorcycles and armored fighting vehicles	3.0	0.1	6.9	Z	9.5	0.1	6.4
371	Railway equipment including locomotives and rolling stock, ralway track fixtures and fittings, and parts	8.9	Z	13.9	Z	16.2	Z	8.6
372	Aircraft and spacecraft	4.1	0.1	26.6	Z	30.6	Z	6.1
373	Ships, boats, and floating structures	7.2	Z	17.8	Z	16.6	Z	14.5
381	Optical elements, instruments, and apparatus, except photographic and cinematographic	8.4	Z	10.8	Z	8.8	Z	6.3
382	Photographic and photocopying machines	10.6	Z	36.3	Z	S	S	15.1
383	Surveying, hydrographic, oceanographic, hydrological, meteorlogical, and geophysical instruments and appliances	13.9	Z	28.0	Z	45.1	Z	19.3
384	Instruments, apparatus, and appliances for medical, surgical, dental, veterinary, or similar purpose	5.7	0.1	13.5	Z	8.1	Z	6.3
385	Meters and other instruments and apparatus for measuring or process control	5.2	Z	25.9	Z	39.9	Z	6.3
390	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	5.7	0.1	4.0	Z	5.0	Z	4.6
401	Arms and ammunition	9.7	Z	12.5	Z	12.6	Z	4.2
402	Toys, games, and sporting equipment	8.0	0.1	13.3	Z	10.8	Z	4.2
409	Miscellaneous manufactured products	3.3	0.1	8.9	Z	6.1	0.1	4.5
411	Metallic waste and scrap	6.2	Z	8.3	0.1	5.3	0.1	9.2
412	Nonmetallic waste and scrap, except from food processing	12.6	Z	12.5	0.1	18.3	0.1	13.9
439	Mixed freight	3.5	0.3	3.1	0.1	2.6	0.1	5.3
999	Commodity unkown	X	X	X	X	X	X	X

S Withheld because estimate did not meet publication standards.
X Not applicable.
Z Rounds to zero.
[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[2] Estimates exclude shipments of crude petroleum (SCTG 16).
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-A7a.

Estimated Coefficients of Variation for Shipment Characteristics by NAICS[1] for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

NAICS code	NAICS description	Value—coefficient of variation of number	Tons—coefficient of variation of number	Ton-miles[2]—coefficient of variation of number	Average miles per shipment—coefficient of variation of number
	Total	**1.0**	**1.3**	**1.8**	**3.4**
212	Mining (except oil and gas)	4.5	4.7	6.7	12.9
31–33	Manufacturing	0.9	1.7	1.0	2.4
311	Food manufacturing	1.2	1.5	2.3	9.9
312	Beverage and tobacco product manufacturing	6.3	6.6	8.3	18.0
313	Textile mills	4.0	5.0	6.9	7.9
314	Textile product mills	2.9	6.0	8.5	3.3
315	Apparel manufacturing	5.1	16.4	34.3	7.4
316	Leather and allied product manufacturing	6.2	10.4	9.6	4.7
321	Wood product manufacturing	2.7	3.3	3.8	7.6
322	Paper manufacturing	2.6	2.5	3.4	4.8
323	Printing and related support activities	2.0	7.1	4.0	2.7
324	Petroleum and coal products manufacturing	5.6	4.2	6.1	7.1
325	Chemical manufacturing	2.8	2.3	3.1	3.1
326	Plastics and rubber products manufacturing	1.6	3.9	3.7	3.5
327	Nonmetallic mineral product manufacturing	2.0	4.2	4.3	6.2
331	Primary metal manufacturing	2.4	5.6	5.5	5.0
332	Fabricated metal product manufacturing	1.7	3.6	5.2	5.2
333	Machinery manufacturing	2.8	9.9	9.6	2.7
334	Computer and electronic product manufacturing	2.6	27.0	27.6	4.7
335	Electrical equipment, appliance, and component manufacturing	2.3	4.8	4.8	5.2
336	Transportation equipment manufacturing	5.8	13.1	6.5	7.4
337	Furniture and related product manufacturing	4.4	6.0	8.5	5.0
339	Miscellaneous manufacturing	1.8	5.4	7.6	2.6
42	Wholesale trade	1.4	2.7	2.6	3.1
423	Merchant wholesalers, durable goods	0.7	6.0	6.1	2.8
4231	Motor vehicle and motor vehicle parts and supplies merchant wholesalers	3.0	8.8	12.9	5.7
4232	Furniture and home furnishing merchant wholesalers	3.4	8.1	8.9	5.3
4233	Lumber and other construction materials merchant wholesalers	2.4	15.5	18.8	16.1
4234	Professional and commercial equipment and supplies merchant wholesalers	4.0	5.8	5.2	7.3
4235	Metal and mineral (except petroleum) merchant wholesalers	1.9	5.9	7.0	9.7
4236	Electrical and electronic goods merchant wholesalers	2.0	7.0	6.2	4.6
4237	Hardware, plumbing and heating equipment and supplies merchant wholesalers	2.0	3.5	9.2	11.2
4238	Machinery, equipment, and supplies merchant wholesalers	1.5	11.7	16.6	5.6
4239	Miscellaneous durable goods merchant wholesalers	2.1	4.9	13.5	3.8
424	Merchant wholesalers, nondurable goods	2.4	2.7	4.0	5.6
4241	Paper and paper product merchant wholesalers	3.9	5.5	9.0	3.7
4242	Drugs and druggists' sundries merchant wholesalers	5.6	8.5	14.1	9.0
4243	Apparel, piece goods, and notions merchant wholesalers	3.3	14.5	4.7	5.1
4244	Grocery and related product merchant wholesalers	1.6	2.5	6.5	16.0
4245	Farm product raw material merchant wholesalers	6.3	3.5	8.2	43.3
4246	Chemical and allied products merchant wholesalers	4.0	16.4	13.8	10.4
4247	Petroleum and petroleum products merchant wholesalers	4.3	5.2	10.1	12.0
4248	Beer, wine, and distilled alcoholic beverage merchant wholesalers	3.2	4.8	10.0	12.1
4249	Miscellaneous nondurable goods merchant wholesalers	3.2	5.8	12.8	8.9
4541	Electronic shopping and mail-order houses	2.4	8.0	7.7	3.5
45431	Fuel dealers	3.0	4.3	4.9	7.1
4931[3]	Warehousing and storage	2.7	4.5	4.5	6.5
5111	Newspaper, periodical, book, and directory publishers	16.0	18.6	23.1	35.7
551114	Corporate, subsidiary, and regional managing offices	12.6	14.8	14.1	12.2

[1] NAICS codes shown are those covered in the Commodity Flow Survey.
[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[3] For tabulation and publication purposes, NAICS 484 is grouped with NAICS 4931.
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-A7b.

Estimated Measures of Reliability for Shipment Characteristics by NAICS[1] for the United States: 2017 and 2012—Con.

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

NAICS code	NAICS description	Value			Tons			Ton-miles[2]			Average miles per shipment		
		Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
		2017	2012		2017	2012		2017	2012		2017	2012	
	Total	**1.0**	**1.1**	**1.5**	**1.3**	**1.8**	**2.5**	**1.8**	**3.7**	**4.3**	**3.4**	**3.4**	**5.2**
212	Mining (except oil and gas)	4.5	3.1	5.1	4.7	2.6	5.3	6.7	9.7	10.5	12.9	3.0	19.4
31–33	Manufacturing	0.9	0.7	1.1	1.7	1.6	2.7	1.0	1.1	1.7	2.4	2.0	3.1
311	Food manufacturing	1.2	2.4	2.8	1.5	4.3	5.3	2.3	4.6	6.0	9.9	10.8	17.7
312	Beverage and tobacco product manufacturing	6.3	7.0	10.5	6.6	2.7	7.0	8.3	4.3	9.1	18.0	14.4	28.9
313	Textile mills	4.0	4.9	6.1	5.0	4.4	6.0	6.9	6.0	9.3	7.9	3.8	8.3
314	Textile product mills	2.9	9.1	11.4	6.0	18.9	20.4	8.5	19.1	22.9	3.3	4.7	5.8
315	Apparel manufacturing	5.1	18.1	21.2	16.4	17.1	21.9	34.3	36.7	48.8	7.4	4.5	7.9
316	Leather and allied product manufacturing	6.2	5.6	8.7	10.4	10.2	14.3	9.6	13.1	17.4	4.7	3.8	6.5
321	Wood product manufacturing	2.7	5.3	8.7	3.3	10.3	11.5	3.8	5.8	8.4	7.6	4.8	11.5
322	Paper manufacturing	2.6	2.4	3.8	2.5	4.4	5.3	3.4	3.9	5.3	4.8	5.7	7.5
323	Printing and related support activities	2.0	2.5	3.5	7.1	7.5	9.7	4.0	10.0	9.5	2.7	5.8	6.2
324	Petroleum and coal products manufacturing	5.6	4.3	4.7	4.2	4.1	6.6	6.1	10.2	14.4	7.1	10.9	10.2
325	Chemical manufacturing	2.8	2.1	3.3	2.3	3.8	5.2	3.1	5.6	6.9	3.1	3.7	4.6
326	Plastics and rubber products manufacturing	1.6	2.6	3.4	3.9	4.9	6.9	3.7	3.8	5.8	3.5	4.3	5.3
327	Nonmetallic mineral product manufacturing	2.0	2.2	3.9	4.2	2.6	6.0	4.3	4.9	7.7	6.2	5.9	10.5
331	Primary metal manufacturing	2.4	1.8	2.6	5.6	6.9	8.2	5.5	3.8	6.0	5.0	7.5	9.2
332	Fabricated metal product manufacturing	1.7	2.1	2.8	3.6	4.4	6.7	5.2	4.2	7.5	5.2	3.9	7.2
333	Machinery manufacturing	2.8	2.8	3.6	9.9	4.7	12.6	9.6	5.1	11.5	2.7	2.0	3.2
334	Computer and electronic product manufacturing	2.6	4.1	4.7	27.0	14.5	35.9	27.6	9.1	36.8	4.7	2.4	5.7
335	Electrical equipment, appliance, and component manufacturing	2.3	3.7	4.7	4.8	6.3	7.8	4.8	5.7	7.1	5.2	1.6	5.7
336	Transportation equipment manufacturing	5.8	3.8	8.5	13.1	6.0	20.2	6.5	5.9	11.0	7.4	4.1	7.6
337	Furniture and related product manufacturing	4.4	3.6	6.6	6.0	3.5	7.1	8.5	5.7	10.1	5.0	4.4	6.1
339	Miscellaneous manufacturing	1.8	2.6	3.6	5.4	14.7	13.9	7.6	10.2	12.0	2.6	2.5	3.6
42	Wholesale trade	1.4	1.5	2.3	2.7	3.6	5.3	2.6	5.1	6.7	3.1	2.9	4.3
423	Merchant wholesalers, durable goods	0.7	1.2	1.7	6.0	7.1	10.4	6.1	8.2	11.1	2.8	4.1	5.1
4231	Motor vehicle and motor vehicle parts and supplies merchant wholesalers	3.0	4.1	6.2	8.8	6.8	15.2	12.9	15.2	20.0	5.7	8.3	8.5
4232	Furniture and home furnishing merchant wholesalers	3.4	4.7	8.5	8.1	15.0	25.7	8.9	27.4	33.5	5.3	6.0	8.3
4233	Lumber and other construction materials merchant wholesalers	2.4	3.0	5.8	15.5	16.7	23.8	18.8	15.1	23.5	16.1	8.6	26.3
4234	Professional and commercial equipment and supplies merchant wholesalers	4.0	2.1	5.4	5.8	6.6	10.9	5.2	9.8	11.6	7.3	6.0	10.3
4235	Metal and mineral (except petroleum) merchant wholesalers	1.9	3.5	3.9	5.9	7.1	9.0	7.0	24.3	17.1	9.7	7.9	12.0
4236	Electrical and electronic goods merchant wholesalers	2.0	4.8	6.3	7.0	6.9	14.3	6.2	5.6	11.0	4.6	6.3	8.8
4237	Hardware, plumbing and heating equipment and supplies merchant wholesalers	2.0	3.4	5.4	3.5	2.6	6.3	9.2	7.4	17.2	11.2	7.1	14.2
4238	Machinery, equipment, and supplies merchant wholesalers	1.5	2.0	2.9	11.7	8.9	21.1	16.6	6.9	29.2	5.6	5.6	7.8
4239	Miscellaneous durable goods merchant wholesalers	2.1	4.6	5.0	4.9	8.1	10.1	13.5	6.8	19.5	3.8	5.1	6.6
424	Merchant wholesalers, nondurable goods	2.4	2.1	3.3	2.7	3.8	5.6	4.0	7.7	10.5	5.6	5.4	8.1
4241	Paper and paper product merchant wholesalers	3.9	3.3	7.0	5.5	4.6	8.8	9.0	10.4	22.0	3.7	10.1	9.9
4242	Drugs and druggists' sundries merchant wholesalers	5.6	5.4	11.5	8.5	9.2	20.9	14.1	16.0	27.6	9.0	6.7	10.0
4243	Apparel, piece goods, and notions merchant wholesalers	3.3	6.5	8.8	14.5	14.9	22.5	4.7	19.3	15.8	5.1	6.5	8.2

See footnotes at end of table.

Table B-A7b.

Estimated Measures of Reliability for Shipment Characteristics by NAICS[1] for the United States: 2017 and 2012—Con.

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

NAICS code	NAICS description	Value			Tons			Ton-miles[2]			Average miles per shipment		
		Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
		2017	2012		2017	2012		2017	2012		2017	2012	
4244	Grocery and related product merchant wholesalers	1.6	2.3	3.8	2.5	5.2	6.8	6.5	5.2	10.0	16.0	9.5	22.6
4245	Farm product raw material merchant wholesalers	6.3	5.8	8.0	3.5	7.6	12.1	8.2	14.3	20.4	43.3	22.1	15.4
4246	Chemical and allied products merchant wholesalers	4.0	7.5	11.1	16.4	8.7	34.4	13.8	14.2	36.2	10.4	10.9	16.1
4247	Petroleum and petroleum products merchant wholesalers	4.3	3.5	3.6	5.2	5.6	7.9	10.1	15.7	19.1	12.0	8.6	10.0
4248	Beer, wine, and distilled alcoholic beverage merchant wholesalers	3.2	3.5	6.4	4.8	4.4	8.0	10.0	7.7	21.3	12.1	8.1	22.2
4249	Miscellaneous nondurable goods merchant wholesalers	3.2	3.5	5.3	5.8	12.1	15.5	12.8	11.3	17.0	8.9	6.7	14.4
4541	Electronic shopping and mail-order houses	2.4	5.1	9.6	8.0	12.6	30.5	7.7	7.7	21.6	3.5	2.4	4.2
45431	Fuel dealers	3.0	2.5	3.7	4.3	2.5	7.4	4.9	7.1	13.4	7.1	1.8	8.3
4931[3]	Warehousing and storage	2.7	3.5	4.4	4.5	7.8	8.4	4.5	4.3	5.8	6.5	4.5	7.2
5111	Newspaper, periodical, book, and directory publishers	16.0	7.1	8.5	18.6	15.9	8.5	23.1	22.3	10.5	35.7	S	S
551114	Corporate, subsidiary, and regional managing offices	12.6	11.2	7.3	14.8	14.8	13.8	14.1	40.6	17.1	12.2	7.7	17.0

S Withheld because estimate did not meet publication standards.
[1] NAICS codes shown are those covered in the Commodity Flow Survey.
[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[3] For tabulation and publication purposes, NAICS 484 is grouped with NAICS 4931.
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-A8.

Estimated Coefficients of Variation for Shipment Characteristics by Origin State: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Origin state	Value—coefficient of variation of number	Tons—coefficient of variation of number	Ton-miles[1]—coefficient of variation of number	Average miles per shipment—coefficient of variation of number
Total	**1.0**	**1.3**	**1.8**	**3.4**
Alabama	2.8	6.9	7.6	12.7
Alaska	12.9	16.9	23.8	30.4
Arizona	2.8	13.4	11.0	4.3
Arkansas	3.3	8.8	8.5	9.9
California	1.2	2.6	6.0	5.2
Colorado	2.9	6.1	13.2	3.2
Connecticut	5.3	8.9	10.9	6.7
Delaware	14.3	15.5	21.2	15.6
District of Columbia	16.1	49.6	46.2	S
Florida	3.5	6.7	7.6	8.5
Georgia	3.4	4.5	2.8	5.3
Hawaii	6.0	12.3	27.9	24.9
Idaho	3.8	5.7	6.7	19.8
Illinois	2.5	2.8	6.7	4.4
Indiana	4.6	4.3	6.4	4.2
Iowa	3.7	3.4	4.8	9.1
Kansas	5.3	5.2	7.5	15.0
Kentucky	6.7	6.5	15.7	7.6
Louisiana	4.5	5.7	7.6	17.3
Maine	2.9	14.1	19.4	19.9
Maryland	4.2	8.9	11.7	9.9
Massachusetts	3.0	10.5	19.4	10.0
Michigan	7.7	14.1	10.2	3.8
Minnesota	4.6	10.9	14.2	6.0
Mississippi	8.8	9.1	7.4	9.3
Missouri	6.6	6.9	13.3	7.4
Montana	6.7	10.8	14.1	16.5
Nebraska	4.1	7.4	9.7	11.4
Nevada	5.8	11.2	14.8	13.3
New Hampshire	5.5	12.4	10.2	8.4
New Jersey	3.9	10.7	7.8	5.6
New Mexico	7.1	14.1	25.2	26.0
New York	1.6	7.8	7.6	3.0
North Carolina	3.4	5.3	2.7	5.1
North Dakota	7.3	9.1	17.0	23.1
Ohio	3.4	6.2	4.3	4.8
Oklahoma	4.5	5.3	4.2	19.2
Oregon	4.1	8.6	6.3	7.1
Pennsylvania	4.6	5.3	10.1	4.8
Rhode Island	12.6	22.1	10.2	10.2
South Carolina	4.0	10.3	9.4	7.1
South Dakota	5.0	11.3	11.1	15.4
Tennessee	6.5	4.7	8.2	5.4
Texas	2.4	5.7	5.5	11.1
Utah	3.5	9.1	8.9	4.1
Vermont	5.8	12.1	27.2	14.0
Virginia	5.3	10.2	13.2	8.1
Washington	2.3	7.4	7.2	8.0
West Virginia	6.3	6.6	15.2	10.7
Wisconsin	2.3	14.3	17.6	3.1
Wyoming	5.7	6.3	9.1	12.5

S Withheld because estimate did not meet publication standards.
[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-A9.

Estimated Coefficients of Variation for Shipment Characteristics by Destination State: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Destination state	Value—coefficient of variation of number	Tons—coefficient of variation of number	Ton-miles[1]—coefficient of variation of number	Average miles per shipment—coefficient of variation of number
Total	**1.0**	**1.3**	**1.8**	**3.4**
Alabama	3.7	5.1	6.8	5.5
Alaska	8.6	15.0	23.7	4.0
Arizona	2.7	10.1	7.6	3.6
Arkansas	3.1	8.1	13.9	7.1
California	1.2	2.7	3.6	3.4
Colorado	2.7	6.6	4.4	5.9
Connecticut	3.4	8.1	20.5	5.7
Delaware	8.5	13.5	12.8	12.9
District of Columbia	27.8	21.7	12.8	13.7
Florida	3.5	5.5	3.8	8.7
Georgia	2.7	5.2	5.9	4.4
Hawaii	7.6	11.7	13.0	8.0
Idaho	3.2	7.2	12.2	6.7
Illinois	2.4	3.8	5.9	5.6
Indiana	1.8	4.9	5.4	4.4
Iowa	1.4	4.3	7.9	5.4
Kansas	2.8	4.4	8.0	11.3
Kentucky	1.9	5.7	7.5	6.3
Louisiana	4.4	5.8	7.2	3.1
Maine	3.5	6.7	4.0	5.6
Maryland	4.1	8.6	16.7	8.7
Massachusetts	3.2	8.7	3.5	4.5
Michigan	6.5	14.0	7.5	7.9
Minnesota	2.8	9.7	6.5	6.9
Mississippi	4.9	7.3	11.6	6.0
Missouri	2.2	6.4	10.7	2.3
Montana	4.0	9.4	6.6	3.1
Nebraska	4.7	7.0	8.6	6.7
Nevada	3.9	10.9	7.6	5.1
New Hampshire	5.2	8.6	4.4	8.6
New Jersey	3.6	8.8	5.1	9.4
New Mexico	4.6	15.0	8.6	8.1
New York	2.3	6.8	3.5	5.4
North Carolina	3.2	4.5	11.4	7.8
North Dakota	3.8	10.8	8.8	8.8
Ohio	3.5	6.6	10.5	5.5
Oklahoma	4.0	4.9	5.3	7.8
Oregon	3.0	8.6	9.7	4.8
Pennsylvania	2.0	4.2	7.2	6.9
Rhode Island	11.4	11.4	14.0	10.8
South Carolina	4.6	9.2	12.1	6.1
South Dakota	6.1	11.0	10.1	6.5
Tennessee	2.0	5.3	7.0	3.9
Texas	1.8	4.6	4.4	7.7
Utah	3.0	9.4	20.9	3.9
Vermont	3.5	13.8	8.0	8.7
Virginia	4.7	7.2	4.7	8.0
Washington	1.7	8.3	10.3	4.0
West Virginia	7.7	6.7	10.5	9.8
Wisconsin	2.2	13.3	9.8	5.2
Wyoming	5.6	17.2	20.4	5.8

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Reliability of the Estimates for Temperature Control Series

Table B-T1a.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Mode of Transportation for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Mode of transportation	Value		Tons		Ton-miles[2]		Average miles per shipment—coefficient of variation of number
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
All modes	**3.1**	**0.0**	**2.6**	**0.0**	**2.3**	**0.0**	**11.8**
Single modes	**2.9**	**0.6**	**2.5**	**0.2**	**2.6**	**0.7**	**4.0**
Truck[3]	2.9	0.6	1.6	1.3	2.3	1.5	4.0
For-hire truck	3.8	1.0	2.1	1.5	3.0	1.6	7.5
Company-owned truck	3.5	0.9	3.6	1.0	3.1	0.5	3.5
Rail	14.6	0.1	24.1	0.6	20.6	1.1	6.9
Water	18.4	0.1	24.5	1.0	25.1	0.6	33.6
Inland water	24.7	0.1	34.2	1.0	25.6	0.4	S
Great Lakes	S	S	S	S	S	S	S
Deep sea	26.1	0.1	35.7	0.5	32.5	0.4	31.7
Multiple waterways	46.9	Z	41.8	Z	S	S	S
Air (includes truck and air)	17.1	0.4	17.0	Z	16.2	0.1	11.5
Pipeline[4]	23.6	Z	21.0	0.1	S	S	S
Multiple modes	**7.9**	**0.6**	**7.1**	**0.2**	**6.6**	**0.7**	**10.9**
Parcel, U.S. Postal Service, or courier	9.2	0.6	7.3	Z	13.6	Z	11.0
Truck and rail	11.1	0.1	9.4	0.2	7.3	0.6	8.9
Truck and water	9.0	0.1	8.0	0.1	12.0	0.2	9.1
Rail and water	19.3	Z	S	S	S	S	21.4
Other multiple modes	28.5	Z	21.3	Z	30.5	0.1	10.3
Other modes	**S**	**S**	**S**	**S**	**S**	**S**	**S**

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[4] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-T1b.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Mode of Transportation for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

Mode of transportation	Value			Tons			Ton-miles[2]			Average miles per shipment		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012		2017	2012		2017	2012	
All modes	**3.1**	**3.2**	**5.2**	**2.6**	**2.3**	**4.2**	**2.3**	**2.1**	**3.5**	**11.8**	**6.0**	**16.5**
Single modes	**2.9**	**2.7**	**4.7**	**2.5**	**2.2**	**4.0**	**2.6**	**2.1**	**3.4**	**4.0**	**5.4**	**6.2**
Truck[3]	2.9	2.9	4.9	1.6	2.3	3.2	2.3	2.6	4.0	4.0	4.6	5.9
For-hire truck	3.8	4.7	8.0	2.1	4.8	6.5	3.0	3.0	4.9	7.5	7.0	5.1
Company-owned truck	3.5	3.0	4.7	3.6	3.8	5.6	3.1	2.7	4.4	3.5	2.7	4.6
Rail	14.6	9.9	8.2	24.1	10.6	17.9	20.6	8.0	10.0	6.9	8.1	7.1
Water	18.4	21.5	55.6	24.5	27.5	190.4	25.1	39.8	80.7	33.6	14.6	18.5
Inland water	24.7	34.2	76.0	34.2	30.6	197.1	25.6	S	S	S	24.7	S
Great Lakes	S	S	S	S	S	S	S	S	S	S	S	S
Deep sea	26.1	20.7	78.9	35.7	12.6	580.7	32.5	22.5	121.1	31.7	14.6	19.5
Multiple waterways	46.9	30.6	54.1	41.8	44.8	24.4	S	27.4	S	S	32.1	S
Air (includes truck and air)	17.1	7.4	33.1	17.0	37.2	30.5	16.2	46.8	22.3	11.5	11.1	14.5
Pipeline[4]	23.6	33.2	125.1	21.0	29.4	263.0	S	S	S	S	S	S
Multiple modes	**7.9**	**10.9**	**16.7**	**7.1**	**17.1**	**59.5**	**6.6**	**8.4**	**30.4**	**10.9**	**6.4**	**16.0**
Parcel, U.S. Postal Service, or courier	9.2	11.7	15.7	7.3	15.7	18.8	13.6	16.9	28.4	11.0	6.6	16.3
Truck and rail	11.1	14.8	34.3	9.4	11.6	49.8	7.3	11.4	37.3	8.9	34.5	58.3
Truck and water	9.0	19.4	206.9	8.0	22.9	204.3	12.0	16.1	66.5	9.1	17.5	15.1
Rail and water	19.3	S	S	S	S	S	S	48.0	S	21.4	S	S
Other multiple modes	28.5	S	S	21.3	S	S	30.5	S	S	10.3	S	S
Other modes	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**

S Withheld because estimate did not meet publication standards.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[4] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-T2a.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Total Modal Activity for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Mode of transportation[2]	Ton-miles[3]		Average miles per shipment—coefficient of variation of number
	Coefficient of variation of number	Standard error of percent of total	
Total	**2.3**	**0.0**	**11.8**
Truck[4]	2.3	1.4	4.0
Rail	9.9	1.2	8.3
Inland water	26.3	0.4	25.3
Great Lakes	S	S	S
Deep sea	22.5	0.4	12.6
Air	16.4	0.1	13.5
Pipeline[5]	S	S	S
Parcel, U.S. Postal Service, or courier	13.6	Z	11.1
Other modes	S	S	S

S Withheld because estimate did not meet publication standards.
Z Rounds to zero.
[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.
[2] Estimates represent activity for a given mode across single and multiple mode shipments. For example, "Truck" ton-miles includes total ton-miles for shipments moving only by truck plus ton-miles for truck segments of multiple mode shipments.
[3] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[4] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.
[5] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-T2b.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Total Modal Activity for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

Mode of transportation[2]	Ton-miles[3]			Average miles per shipment		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012	
Total	**2.3**	**2.1**	**3.5**	**11.8**	**5.8**	**16.5**
Truck[4]	2.3	2.5	3.9	4.0	4.6	5.9
Rail	9.9	6.5	10.8	8.3	13.2	18.3
Inland water	26.3	43.7	62.1	25.3	35.1	137.3
Great Lakes	S	S	S	S	36.3	S
Deep sea	22.5	17.3	65.9	12.6	13.1	7.5
Air	16.4	S	S	13.5	13.3	17.0
Pipeline[5]	S	S	S	S	S	S
Parcel, U.S. Postal Service, or courier	13.6	16.9	28.6	11.1	6.8	16.5
Other modes	S	S	S	S	S	S

S Withheld because estimate did not meet publication standards.
[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.
[2] Estimates represent activity for a given mode across single and multiple mode shipments. For example, "Truck" ton-miles includes total ton-miles for shipments moving only by truck plus ton-miles for truck segments of multiple mode shipments.
[3] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[4] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.
[5] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-T3a.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Distance Shipped for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Distance shipped[2] (Based on Great Circle Distance)	Value		Tons		Ton-miles[3]	
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
Total	**3.1**	**0.0**	**2.6**	**0.0**	**2.3**	**0.0**
Less than 50 miles	3.6	0.7	4.7	1.1	4.1	0.1
50 to 99 miles	3.7	0.3	6.1	0.8	6.4	0.3
100 to 249 miles	2.2	0.6	2.7	0.7	3.3	0.5
250 to 499 miles	3.5	0.2	6.1	0.5	4.8	0.6
500 to 749 miles	7.2	0.3	3.9	0.3	4.0	0.5
750 to 999 miles	12.5	0.5	5.8	0.2	6.2	0.6
1,000 to 1,499 miles	5.0	0.2	2.5	0.1	2.6	0.3
1,500 to 1,999 miles	5.7	0.1	4.9	0.1	5.2	0.5
2,000 miles or more	6.7	0.1	7.6	0.1	7.4	0.6

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Shipments are grouped into distance categories based on Great Circle Distance (GCD). GCD is the shortest distance between two points on the surface of a sphere over the surface of that sphere.

[3] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-T3b.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Distance Shipped for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

Distance shipped[2] (Based on Great Circle Distance)	Value			Tons			Ton-miles[3]		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012		2017	2012	
Total	**3.1**	**3.2**	**5.2**	**2.6**	**2.3**	**4.2**	**2.3**	**2.1**	**3.5**
Less than 50 miles	3.6	4.5	6.9	4.7	4.2	8.3	4.1	4.8	8.1
50 to 99 miles	3.7	8.3	9.3	6.1	4.4	8.7	6.4	4.4	9.1
100 to 249 miles	2.2	3.1	4.5	2.7	3.7	5.4	3.3	3.9	6.2
250 to 499 miles	3.5	3.9	5.6	6.1	2.5	7.7	4.8	4.1	6.9
500 to 749 miles	7.2	3.8	10.9	3.9	6.8	7.7	4.0	6.1	7.3
750 to 999 miles	12.5	4.8	18.3	5.8	6.5	8.9	6.2	6.2	9.0
1,000 to 1,499 miles	5.0	4.8	8.7	2.5	4.7	5.9	2.6	5.4	6.7
1,500 to 1,999 miles	5.7	6.6	17.5	4.9	6.9	10.7	5.2	7.4	11.5
2,000 miles or more	6.7	6.5	14.6	7.6	5.4	10.3	7.4	5.3	9.8

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Shipments are grouped into distance categories based on Great Circle Distance (GCD). GCD is the shortest distance between two points on the surface of a sphere over the surface of that sphere.

[3] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-T4a.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Shipment Weight for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Shipment weight	Value		Tons		Ton-miles[2]		Average miles per shipment—coefficient of variation of number
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
Total	**3.1**	**0.0**	**2.6**	**0.0**	**2.3**	**0.0**	**11.8**
Less than 50 lbs	7.1	0.4	6.7	Z	11.3	Z	14.9
50 to 99 lbs	7.5	0.2	4.7	Z	5.0	Z	5.5
100 to 499 lbs	4.5	0.3	4.5	0.1	6.6	0.1	6.2
500 to 749 lbs	4.0	0.1	2.8	0.1	5.0	Z	3.7
750 to 999 lbs	3.7	0.1	2.6	Z	4.0	Z	3.9
1,000 to 9,999 lbs	4.3	0.9	2.2	0.4	2.4	0.5	3.9
10,000 to 49,999 lbs	4.2	0.9	3.1	1.4	3.1	1.3	2.4
50,000 to 99,999 lbs	6.6	0.2	8.7	1.1	8.5	0.6	2.5
100,000 lbs or more	12.2	0.2	15.6	1.3	12.0	1.6	5.7

Z Rounds to zero.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-T4b.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Shipment Weight for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

Shipment weight	Value			Tons			Ton-miles[2]			Average miles per shipment		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012		2017	2012		2017	2012	
Total	**3.1**	**3.2**	**5.2**	**2.6**	**2.3**	**4.2**	**2.3**	**2.1**	**3.5**	**11.8**	**6.0**	**16.5**
Less than 50 lbs	7.1	8.0	13.2	6.7	8.4	14.3	11.3	12.6	22.9	14.9	10.6	20.8
50 to 99 lbs	7.5	13.6	14.9	4.7	10.1	12.1	5.0	15.2	18.2	5.5	14.0	15.8
100 to 499 lbs	4.5	6.8	8.5	4.5	5.7	8.3	6.6	6.1	10.6	6.2	6.7	9.5
500 to 749 lbs	4.0	7.9	10.7	2.8	3.6	5.4	5.0	4.7	8.7	3.7	3.5	5.6
750 to 999 lbs	3.7	6.5	7.9	2.6	2.5	4.2	4.0	3.4	6.5	3.9	3.4	5.5
1,000 to 9,999 lbs	4.3	5.4	9.1	2.2	4.0	5.1	2.4	3.2	4.8	3.9	3.0	5.1
10,000 to 49,999 lbs	4.2	2.5	5.7	3.1	2.3	4.5	3.1	2.6	4.5	2.4	2.6	3.6
50,000 to 99,999 lbs	6.6	15.8	19.8	8.7	14.5	23.8	8.5	12.2	20.9	2.5	9.7	10.2
100,000 lbs or more	12.2	7.1	12.1	15.6	10.8	28.0	12.0	7.5	12.9	5.7	8.5	9.5

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-T5a.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Two-Digit Commodity for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

SCTG code	Commodity description	Value		Tons		Ton-miles[2]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
	All commodities[3]	**3.1**	**0.0**	**2.6**	**0.0**	**2.3**	**0.0**	**11.8**
01	Live animals and live fish	18.3	Z	18.6	Z	26.2	Z	14.8
02	Cereal grains (includes seed)	S	S	S	S	S	S	15.9
03	Agricultural products (excludes animal feed, cereal grains, and forage products)	8.0	0.5	11.3	1.0	14.9	1.7	22.6
04	Animal feed, eggs, honey, and other products of animal origin	10.2	0.1	21.8	0.2	11.2	0.1	21.3
05	Meat, poultry, fish, seafood, and their preparations	2.3	0.7	2.3	0.5	4.5	0.8	15.6
06	Milled grain products and preparations and bakery products	12.5	0.3	8.1	0.2	16.4	0.7	15.6
07	Other prepared foodstuffs and fats and oils	3.3	0.3	3.6	0.7	3.4	0.8	8.4
08	Alcoholic beverages, and denatured alcohol	10.8	0.2	9.0	0.1	18.3	0.2	34.2
09	Tobacco products	17.4	Z	31.5	Z	44.2	Z	25.1
10	Monumental or building stone	S	S	S	S	S	S	S
11	Natural sands	S	S	38.1	0.1	S	S	S
12	Gravel and crushed stone (excludes dolomite and slate)	26.0	Z	S	S	S	S	15.0
13	Other nonmetallic minerals, n.e.c.	34.2	Z	42.0	0.1	S	S	43.8
14	Metallic ores and concentrates	40.1	0.1	S	S	S	S	S
15	Coal	S	S	S	S	S	S	S
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	13.4	Z	16.7	0.2	25.3	0.3	24.2
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	27.2	0.1	36.1	0.5	24.1	0.2	S
19	Other coal and petroleum products, n.e.c.	12.1	0.2	10.7	1.4	20.2	1.1	12.7
20	Basic chemicals	9.8	0.1	9.3	0.8	6.7	0.5	36.2
21	Pharmaceutical products	8.5	1.3	9.8	Z	10.3	0.1	9.2
22	Fertilizers	18.4	0.1	24.1	0.7	26.9	0.8	21.9
23	Chemical products and preparations, n.e.c.	7.9	0.2	12.4	0.2	10.6	0.3	13.2
24	Plastics and rubber	15.1	Z	26.5	Z	37.3	0.1	19.4
25	Logs and other wood in the rough	S	S	34.0	Z	S	S	22.8
26	Wood products	25.6	Z	S	S	38.7	Z	S
27	Pulp, newsprint, paper, and paperboard	39.0	Z	S	S	S	S	S
28	Paper or paperboard articles	27.1	Z	34.1	Z	41.9	Z	35.5
29	Printed products	29.1	Z	26.8	Z	33.5	Z	22.5
30	Textiles, leather, and articles of textiles or leather	42.0	Z	44.8	Z	S	S	S
31	Nonmetallic mineral products	35.5	Z	43.1	0.3	S	S	19.8
32	Base metal in primary or semifinished forms and in finished basic shapes	33.9	Z	29.9	Z	30.6	Z	38.8
33	Articles of base metal	38.6	Z	37.0	Z	49.8	Z	S
34	Machinery	25.5	Z	47.0	Z	46.7	Z	23.6
35	Electronic and other electrical equipment and components and office equipment	27.0	Z	41.6	Z	33.3	Z	18.9
36	Motorized and other vehicles (including parts)	15.8	Z	S	S	28.3	Z	43.3
37	Transportation equipment, n.e.c.	39.7	Z	35.3	Z	S	S	32.9
38	Precision instruments and apparatus	29.1	Z	31.9	Z	34.5	Z	S
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	S	S	S	S	S	S	S

See footnotes at end of table.

Table B-T5a.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Two-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

SCTG code	Commodity description	Value		Tons		Ton-miles[2]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
40	Miscellaneous manufactured products	13.7	Z	37.2	Z	32.5	Z	18.9
41	Waste and scrap	S	S	S	S	S	S	S
43	Mixed freight	4.9	0.8	3.4	0.7	3.8	0.5	3.8
99	Commodity unknown	X	X	X	X	X	X	X

S Withheld because estimate did not meet publication standards.
X Not applicable.
Z Rounds to zero.
[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.
[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[3] Estimates exclude shipments of crude petroleum (SCTG 16).
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-T5b.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Two-Digit Commodity for the United States: 2017 and 2012—Con.

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

SCTG code	Commodity description	Value			Tons			Ton-miles[2]			Average miles per shipment		
		Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
		2017	2012		2017	2012		2017	2012		2017	2012	
	All commodities[3]	**3.1**	**3.2**	**5.2**	**2.6**	**2.3**	**4.2**	**2.3**	**2.1**	**3.5**	**11.8**	**6.0**	**16.5**
01	Live animals and live fish	18.3	32.0	135.1	18.6	29.3	115.8	26.2	S	S	14.8	29.2	59.8
02	Cereal grains (includes seed)	S	S	S	S	S	S	S	S	S	15.9	16.2	54.8
03	Agricultural products (excludes animal feed, cereal grains, and forage products)	8.0	7.1	18.4	11.3	5.7	18.3	14.9	11.4	26.7	22.6	21.0	32.8
04	Animal feed, eggs, honey, and other products of animal origin	10.2	15.6	34.7	21.8	23.0	37.9	11.2	27.5	24.5	21.3	19.5	12.3
05	Meat, poultry, fish, seafood, and their preparations	2.3	3.4	4.7	2.3	3.3	4.1	4.5	4.0	6.3	15.6	8.9	23.7
06	Milled grain products and preparations and bakery products	12.5	8.8	18.0	8.1	10.2	15.4	16.4	14.0	23.1	15.6	10.6	18.4
07	Other prepared foodstuffs and fats and oils	3.3	4.6	6.6	3.6	4.3	5.6	3.4	6.9	8.3	8.4	10.3	18.4
08	Alcoholic beverages, and denatured alcohol	10.8	10.0	23.2	9.0	17.2	23.8	18.3	21.7	14.9	34.2	14.5	93.8
09	Tobacco products	17.4	21.6	16.4	31.5	21.1	23.6	44.2	23.1	54.2	25.1	8.8	70.1
10	Monumental or building stone	S	S	S	S	S	S	S	S	S	S	S	S
11	Natural sands	S	S	S	38.1	S	S	S	S	S	S	S	S
12	Gravel and crushed stone (excludes dolomite and slate)	26.0	S	S	S	41.7	S	S	S	S	15.0	28.2	14.4
13	Other nonmetallic minerals, n.e.c.	34.2	30.0	29.8	42.0	37.8	136.5	S	32.1	S	43.8	S	S
14	Metallic ores and concentrates	40.1	S	S	S	S	S	S	S	S	S	5.3	S
15	Coal	S	S	S	S	S	S	S	S	S	S	S	S
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	13.4	19.9	96.7	16.7	20.2	147.5	25.3	35.6	114.4	24.2	S	S
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	27.2	S	S	36.1	S	S	24.1	S	S	S	27.9	S
19	Other coal and petroleum products, n.e.c.	12.1	15.4	15.1	10.7	11.1	19.2	20.2	11.0	23.9	12.7	10.6	14.9
20	Basic chemicals	9.8	11.0	13.4	9.3	15.1	28.5	6.7	22.4	19.1	36.2	9.7	28.9
21	Pharmaceutical products	8.5	9.7	16.5	9.8	13.1	27.7	10.3	15.6	28.8	9.2	5.0	7.0
22	Fertilizers	18.4	29.6	33.2	24.1	21.0	57.8	26.9	27.6	46.9	21.9	15.5	5.7
23	Chemical products and preparations, n.e.c.	7.9	11.5	22.5	12.4	14.0	32.4	10.6	12.4	27.7	13.2	13.9	25.0
24	Plastics and rubber	15.1	18.2	29.6	26.5	27.4	53.4	37.3	32.3	61.4	19.4	8.2	17.8
25	Logs and other wood in the rough	S	S	S	34.0	S	S	S	S	S	22.8	S	S
26	Wood products	25.6	S	S	S	S	S	38.7	S	S	S	S	S
27	Pulp, newsprint, paper, and paperboard	39.0	34.1	9707.5	S	S	S	S	S	S	S	S	S
28	Paper or paperboard articles	27.1	31.5	402.9	34.1	22.6	1972.4	41.9	37.5	14867.4	35.5	24.5	69.1
29	Printed products	29.1	S	S	26.8	S	S	33.5	44.1	2772.4	22.5	38.4	20.9
30	Textiles, leather, and articles of textiles or leather	42.0	34.7	43.5	44.8	36.0	41.0	S	35.9	S	S	37.1	S
31	Nonmetallic mineral products	35.5	22.3	134.5	43.1	33.0	100.1	S	31.1	S	19.8	22.5	19.6
32	Base metal in primary or semifinished forms and in finished basic shapes	33.9	40.1	53.3	29.9	S	S	30.6	40.5	79.4	38.8	S	S
33	Articles of base metal	38.6	S	S	37.0	S	S	49.8	S	S	S	26.3	S
34	Machinery	25.5	40.7	268.8	47.0	S	S	46.7	S	S	23.6	36.5	64.3
35	Electronic and other electrical equipment and components and office equipment	27.0	S	S	41.6	S	S	33.3	S	S	18.9	S	S

See footnotes at end of table.

Table B-T5b.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Two-Digit Commodity for the United States: 2017 and 2012—Con.

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

SCTG code	Commodity description	Value			Tons			Ton-miles[2]			Average miles per shipment		
		Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
		2017	2012		2017	2012		2017	2012		2017	2012	
36	Motorized and other vehicles (including parts)	15.8	S	S	S	S	S	28.3	S	S	43.3	S	S
37	Transportation equipment, n.e.c.	39.7	S	S	35.3	S	S	S	S	S	32.9	S	S
38	Precision instruments and apparatus	29.1	19.3	22.6	31.9	30.0	17.5	34.5	27.4	14.8	S	18.6	S
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	S	45.4	S	S	S	S	S	S	S	S	6.5	S
40	Miscellaneous manufactured products	13.7	S	S	37.2	28.9	194.5	32.5	36.8	96.7	18.9	27.4	65.3
41	Waste and scrap	S	S	S	S	S	S	S	S	S	S	S	S
43	Mixed freight	4.9	3.1	6.2	3.4	3.7	5.3	3.8	5.1	7.2	3.8	5.4	6.6
99	Commodity unknown	X	44.3	X	X	S	X	X	S	X	X	12.1	X

S Withheld because estimate did not meet publication standards.

X Not applicable.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] Estimates exclude shipments of crude petroleum (SCTG 16).

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-T6.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Three-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

SCTG code	Commodity description	Value		Tons		Ton-miles[2]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
	All commodities[3]	**3.1**	**0.0**	**2.6**	**0.0**	**2.3**	**0.0**	**11.8**
010	Live animals and live fish	18.3	Z	18.6	Z	26.2	Z	14.8
021	Wheat	S	S	S	S	S	S	S
022	Corn, except sweet	S	S	S	S	S	S	15.9
029	Other cereal grains	S	S	S	S	S	S	S
031	Fresh or chilled potatoes, except sweet	13.1	0.1	15.0	0.1	21.6	0.4	34.0
032	Fresh or chilled edible vegetables (except potatoes), and dried vegetables	5.7	0.1	10.3	0.3	19.3	0.8	24.3
033	Fruit and nuts, edible, fresh, chilled, or dried	13.6	0.3	21.9	0.9	27.1	1.4	24.8
034	Soy beans	43.1	Z	44.0	0.1	S	S	S
035	Oil seeds and nuts, except olives and soy beans	49.7	Z	44.0	Z	S	S	45.5
036	Bulbs, live plants, and seeds for sowing, n.e.c.	S	S	33.0	Z	33.6	Z	22.4
039	Fresh-cut flowers, plants, and parts of plants, and other agricultural products	12.1	Z	19.8	Z	31.2	0.1	S
041	Eggs, cereal straw or husks, forage products, residues and waste from the food industries used in animal feeding, other products of animal origin, n.e.c.	11.3	0.1	12.3	0.1	12.4	0.1	21.9
042	Animal feed preparations	36.1	Z	S	S	40.3	0.1	S
051	Meat and poultry, fresh, chilled, or frozen, meat in brine, dried or smoked	2.0	0.6	2.2	0.4	4.0	0.6	21.3
052	Fish (except live), seafood, and their preparations	6.5	0.2	9.3	0.1	12.7	0.2	33.4
053	Preparations, extracts, and juices of meat, fish, or seafood	22.5	Z	19.6	Z	17.8	Z	24.4
061	Wheat flour, groats, and meal	34.7	Z	33.3	Z	35.3	Z	S
062	Malt, milled rice and corn (broken, flour, groats, and meal, inulin, wheat gluten, milled cereals and other vegetables and grains)	24.4	Z	35.8	0.1	40.1	0.2	33.0
063	Bakery products and food preparations of cereals, flour, starch or milk	15.1	0.1	18.9	0.2	28.2	0.3	21.2
064	Bakery products, including frozen	14.5	0.2	11.1	0.2	18.6	0.6	17.9
071	Dairy products except beverages and preparations of milk	4.6	0.2	5.3	0.5	5.0	0.5	6.0
072	Processed or prepared vegetables, fruit, or nuts, except dried or milled, and juices	10.0	0.2	11.4	0.3	10.9	0.6	8.9
073	Coffee, tea, and spices, except unprocessed coffee and unfermented tea	23.4	Z	36.7	Z	35.0	0.1	27.1
074	Animal or vegetable fats, oils, waxes, and their cleavage products, prepared edible fats, and flours and meals of oil seeds (excludes oils and fats for use as biodiesel)	28.1	0.1	22.3	0.2	22.8	0.3	14.5
075	Sugars confectionery, solid or syrups not containing added flavoring or coloring	28.5	Z	35.1	Z	42.0	0.1	41.5
076	Confectionery, cocoa, and cocoa preparations	9.3	0.1	9.9	0.1	9.6	0.2	12.8
077	Edible preparations, n.e.c., and vinegar	10.5	0.1	12.9	0.1	16.0	0.4	18.4
078	Nonalcoholic beverages, n.e.c., and ice	13.1	0.1	11.9	0.3	26.6	0.9	27.5
081	Malt beer	11.9	0.1	10.8	0.1	16.4	0.1	5.5
082	Wine and other fermented beverages	19.7	0.2	15.8	Z	29.7	0.1	28.0
083	Spirituous beverages and undenatured ethyl alcohol	18.0	Z	13.8	Z	33.8	Z	13.0
084	Denatured ethyl alcohol, not for ingestion or use as biofuel	S	S	S	S	S	S	37.4
090	Tobacco products	17.4	Z	31.5	Z	44.2	Z	25.1
100	Monumental or building stone, except dolomite	S	S	S	S	S	S	S
110	Natural sands, except metal-bearing	S	S	38.1	0.1	S	S	S
120	Gravel and crushed stone, except dolomite and slate	26.0	Z	S	S	S	S	15.0
131	Salt	S	S	34.3	Z	43.3	Z	40.0
132	Natural calcium phosphates, natural aluminum-calcium phosphates, and phosphatic chalk	S	S	S	S	S	S	S
133	Dolomite, including monumental, building, and crushed	S	S	S	S	S	S	S
139	Other nonmetallic minerals, n.e.c.	41.6	Z	38.7	0.1	S	S	S
141	Iron ores and concentrates	S	S	S	S	S	S	S

See footnotes at end of table.

Table B-T6.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Three-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

SCTG code	Commodity description	Value		Tons		Ton-miles[2]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
149	Metallic ores and concentrates, except iron	40.1	0.1	S	S	S	S	S
151	Nonagglomerated bituminous coal	S	S	S	S	S	S	S
159	Coal, except nonagglomerated bituminous coal	S	S	S	S	S	S	S
171	Gasoline, and blends of gasoline and 10 percent ethanol	S	S	38.2	Z	S	S	31.9
172	Aviation turbine fuel (types a and b), and kerosene	40.0	Z	43.3	0.1	34.0	Z	21.7
175	Ethanol, ethanol blends of more than 10 percent ethanol, and other fuel alcohols	26.8	Z	34.1	0.1	31.7	0.3	26.1
176	Ethanol, for use as biofuels	30.1	Z	32.5	0.1	39.9	0.1	33.8
181	Fuel oils	S	S	S	S	S	S	S
182	Blends of fuel oils and biofuel, biodiesel	30.4	0.1	36.5	0.3	30.9	0.2	29.7
191	Lubricating oils and greases	33.2	Z	29.5	Z	35.5	Z	32.3
192	Refined petroleum oils and oils obtained from bituminous minerals, n.e.c.	42.0	Z	48.1	0.1	21.7	Z	42.6
193	Gaseous hydrocarbons	22.0	Z	17.9	0.1	20.5	Z	16.0
199	Other products of petroleum refining, and coal products, n.e.c.	12.9	0.2	11.2	1.3	21.6	1.1	9.2
201	Sodium hydroxide (caustic soda) and potassium hydroxide (caustic potash)	37.2	Z	47.7	0.1	S	S	40.1
202	Inorganic chemicals, n.e.c.	8.1	0.1	11.6	0.9	11.4	0.5	6.7
203	Cyclic hydrocarbons	37.2	0.1	41.3	0.2	38.8	0.2	44.2
204	Phenols, phenol-alcohols, aldehydes, cyclic polymers of aldehydes, and acyclic alcohols, and organic acids	21.3	Z	18.5	0.1	25.2	0.2	17.9
205	Organic chemicals, n.e.c.	24.5	0.1	17.2	0.1	24.6	0.4	21.8
210	Pharmaceutical products	8.5	1.3	9.8	Z	10.3	0.1	9.2
220	Fertilizers and fertilizer materials	18.4	0.1	24.1	0.7	26.9	0.8	21.9
231	Paints and varnishes, enamels, tanning or dyeing extracts, tannins and their derivatives, inks, lakes, toners, and ink	10.9	0.1	21.5	0.1	14.8	0.1	37.8
232	Essential oils and resinoids, and perfumery, cosmetic, or toilet preparations	27.1	0.1	22.4	Z	25.0	0.1	15.2
233	Soap, organic surface-active agents, cleaning preparations, polishes and creams, and scouring preps	20.5	Z	26.4	Z	36.7	0.2	19.6
234	Photographic film, plates, paper, paperboard, or textiles, and chemical preps for photographic use	24.0	Z	40.4	Z	S	S	21.8
235	Insecticides, rodenticides, fungicides, herbicides, disinfectants, etc.	21.9	Z	18.4	Z	24.7	Z	S
239	Other chemical products and preparations: glues, prepared explosives, activated natural mineral products, anti-knock preparations, etc.	19.5	0.1	23.9	0.2	27.9	0.3	8.7
241	Plastics and rubber in primary forms or sheets	22.9	Z	36.0	Z	40.3	Z	14.8
242	Manmade fibers and plastics basic shapes and articles	19.0	Z	29.2	Z	42.2	0.1	19.1
243	Rubber articles	26.2	Z	S	S	S	S	S
250	Logs and other wood in the rough	S	S	34.0	Z	S	S	22.8
261	Wood chips or particles	S	S	S	S	S	S	19.7
262	Lumber, wood continuously shaped along any of its edges or faces, shingles and shakes	S	S	S	S	S	S	12.6
263	Veneer sheets and sheets for plywood, particle board, fiberboard, plywood, and similar laminated wood	S	S	S	S	S	S	31.5
264	Windows, doors, thresholds, and builders' joinery and carpentry of wood, except shingles and shakes	S	S	S	S	S	S	S
269	Other wood products	S	S	S	S	S	S	S
271	Pulp of fibrous cellulosic materials	S	S	S	S	S	S	S
272	Newsprint in large rolls or sheets	S	S	S	S	S	S	S
273	Uncoated paper, tissue, and paperboard in large rolls or sheets	41.0	Z	S	S	S	S	32.2

See footnotes at end of table.

Table B-T6.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Three-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

SCTG code	Commodity description	Value		Tons		Ton-miles[2]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
274	Coated, impregnated, treated, or worked paper and paperboard, in large rolls or sheets	38.3	Z	S	S	S	S	S
280	Paper or paperboard articles	27.1	Z	34.1	Z	41.9	Z	35.5
291	Printed books, brochures, leaflets, and similar printed products	S	S	S	S	S	S	29.5
292	Newspapers, journals, and periodicals	S	S	S	S	S	S	S
293	Advertising material, commercial or trade catalogues, and similar printed products	26.2	Z	22.0	Z	40.3	Z	32.3
299	Other printed products	26.4	Z	27.6	Z	24.3	Z	48.0
301	Textile fibers, yarns, and broad woven or knitted fabrics	S	S	S	S	S	S	S
302	Textile clothing and accessories, and headgear, except safety	S	S	S	S	S	S	S
303	Textiles and textile articles, n.e.c.	45.9	Z	S	S	S	S	S
304	Leather footwear	34.5	Z	S	S	S	S	S
305	Leather and articles of leather or allied materials, and dressed fur skins	20.6	Z	49.5	Z	S	S	S
311	Hydraulic cements	34.9	Z	31.7	0.7	S	S	48.9
312	Ceramic products	31.7	Z	45.1	Z	S	S	S
313	Glass and glass products	44.5	Z	37.7	Z	45.9	Z	24.4
319	Other nonmetallic mineral products	49.9	Z	S	S	32.0	Z	S
321	Ferro-alloys, and iron and steel in primary or semi-finished forms, or in powders or granules	S	S	S	S	S	S	S
322	Flat-rolled products of iron or steel	25.3	Z	8.7	Z	19.3	Z	32.5
323	Bars, rods, angles, shapes, sections, and wire, of iron or steel	S	S	40.2	Z	S	S	S
324	Nonferrous metal, except precious, unwrought, or in finished basic shapes, or in powders orgranules	33.5	Z	26.8	Z	S	S	S
331	Pipes, tubes, and fittings	34.3	Z	S	S	36.0	Z	S
332	Structures and parts, except prefabricated buildings	S	S	S	S	S	S	S
333	Hand tools, cutlery, except of precious metals, interchangeable tools for hand or machine tools,hardware, and industrial fasteners	23.6	Z	45.4	Z	S	S	S
339	Other articles of metal	S	S	46.2	Z	S	S	S
341	Internal-combustion engines and parts	S	S	S	S	S	S	45.0
342	Turbines, boilers, nuclear reactors, and nonelectric engines and motors, except internal-combustion	49.9	Z	S	S	S	S	26.9
343	Pumps, compressors, fans, and ventilating or recycling hoods incorporating a fan	S	S	S	S	S	S	29.2
344	Air-conditioning, refrigerating, or freezing equipment	40.0	Z	S	S	41.7	Z	S
345	Materials-handling, excavating, boring, and related machinery and equipment	S	S	S	S	S	S	S
349	Other mechanical machinery, n.e.c.	44.8	Z	S	S	32.0	Z	26.1
351	Electric motors, generators, rotary or static converters, and transformers	S	S	S	S	S	S	S
352	Electric cooking appliances, electro-thermic, or electro-mechanical domestic appliances	43.6	Z	36.8	Z	27.3	Z	45.5
353	Line telephone or telegraph apparatus	S	S	S	S	S	S	S
354	Electronic entertainment products, except parts	S	S	S	S	S	S	S
355	Computer and electronic office equipment	S	S	S	S	S	S	S
356	Prepared unrecorded or prerecorded media	S	S	S	S	S	S	S
357	Transmission, and reception apparatus for radio, television, radar, and remote-control	31.3	Z	33.5	Z	43.5	Z	4.0
358	Electronic components and parts	S	S	S	S	S	S	31.1
359	Other electronic and electrical equipment, n.e.c.	43.4	Z	45.1	Z	43.4	Z	S

See footnotes at end of table.

Table B-T6.

Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled[1] Shipments by Three-Digit Commodity for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

SCTG code	Commodity description	Value		Tons		Ton-miles[2]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
361	Motorized vehicles for transport of less than 10 people, except motorcycles, armored, and recreational	S	S	S	S	S	S	S
362	Motor vehicles for the transport of goods, and road tractors for semi-trailers	S	S	S	S	S	S	S
363	Other vehicles	36.0	Z	S	S	35.1	Z	S
364	Motor vehicles parts and accessories except motorcycles and armored fighting vehicles	36.6	Z	49.4	Z	S	S	25.8
371	Railway equipment including locomotives and rolling stock, railway track fixtures and fittings, and parts	S	S	S	S	S	S	S
372	Aircraft and spacecraft	39.7	Z	35.3	Z	S	S	32.9
373	Ships, boats, and floating structures	S	S	S	S	S	S	S
381	Optical elements, instruments, and apparatus, except photographic and cinematographic	S	S	S	S	S	S	24.4
382	Photographic and photocopying machines	S	S	S	S	40.7	Z	S
383	Surveying, hydrographic, oceanographic, hydrological, meteorological, and geophysical instruments and appliances	S	S	S	S	S	S	36.6
384	Instruments, apparatus, and appliances for medical, surgical, dental, veterinary, or similar purposes	S	S	S	S	S	S	8.6
385	Meters and other instruments and apparatus for measuring or process control	29.8	Z	34.6	Z	38.4	Z	15.6
390	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	S	S	S	S	S	S	S
401	Arms and ammunition	S	S	S	S	S	S	4.9
402	Toys, games, and sporting equipment	43.2	Z	46.5	Z	S	S	24.6
409	Miscellaneous manufactured products	14.0	Z	39.1	Z	38.2	Z	19.1
411	Metallic waste and scrap	S	S	S	S	S	S	S
412	Nonmetallic waste and scrap, except from food processing	S	S	S	S	S	S	S
439	Mixed freight	4.9	0.8	3.4	0.7	3.8	0.5	3.8
999	Commodity unknown	X	X	X	X	X	X	X

S Withheld because estimate did not meet publication standards.
X Not applicable.
Z Rounds to zero.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] Estimates exclude shipments of crude petroleum (SCTG 16).

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-T7a.

Estimated Coefficients of Variation for Shipment Characteristics of Temperature Controlled[1] Shipments by NAICS[2] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

NAICS code	NAICS description	Value—coefficient of variation of number	Tons—coefficient of variation of number	Ton-miles[3]—coefficient of variation of number	Average miles per shipment—coefficient of variation of number
	Total	**3.1**	**2.6**	**2.3**	**11.8**
212	Mining (except oil and gas)	47.6	23.0	S	S
31–33	Manufacturing	2.4	4.4	2.9	10.5
311	Food manufacturing	2.5	3.7	3.2	4.6
312	Beverage and tobacco product manufacturing	14.0	9.0	14.5	25.9
313	Textile mills	S	S	S	S
314	Textile product mills	S	S	S	S
315	Apparel manufacturing	S	S	S	S
316	Leather and allied product manufacturing	S	43.9	35.5	S
321	Wood product manufacturing	36.2	S	S	21.9
322	Paper manufacturing	22.4	S	S	17.1
323	Printing and related support activities	26.2	30.7	28.4	11.1
324	Petroleum and coal products manufacturing	14.3	16.8	13.6	12.8
325	Chemical manufacturing	7.5	9.4	10.2	5.9
326	Plastics and rubber products manufacturing	9.8	18.4	16.9	18.8
327	Nonmetallic mineral product manufacturing	23.1	43.4	S	S
331	Primary metal manufacturing	33.1	24.0	45.0	35.5
332	Fabricated metal product manufacturing	36.1	31.6	S	23.3
333	Machinery manufacturing	20.5	20.5	23.5	13.3
334	Computer and electronic product manufacturing	S	43.6	32.4	10.3
335	Electrical equipment, appliance, and component manufacturing	31.6	46.6	43.9	24.4
336	Transportation equipment manufacturing	35.9	S	S	S
337	Furniture and related product manufacturing	S	S	S	40.6
339	Miscellaneous manufacturing	29.2	29.0	31.8	15.6
42	Wholesale trade	2.7	5.0	6.5	8.4
423	Merchant wholesalers, durable goods	21.6	16.6	28.4	21.1
4231	Motor vehicle and motor vehicle parts and supplies merchant wholesalers	44.4	S	S	28.3
4232	Furniture and home furnishing merchant wholesalers	34.5	S	S	S
4233	Lumber and other construction materials merchant wholesalers	33.7	33.8	33.2	38.2
4234	Professional and commercial equipment and supplies merchant wholesalers	28.2	28.4	46.6	22.8
4235	Metal and mineral (except petroleum) merchant wholesalers	34.7	43.7	40.5	46.3
4236	Electrical and electronic goods merchant wholesalers	S	S	S	31.1
4237	Hardware, plumbing and heating equipment and supplies merchant wholesalers	32.8	47.7	S	S
4238	Machinery, equipment, and supplies merchant wholesalers	24.3	36.6	42.2	18.1
4239	Miscellaneous durable goods merchant wholesalers	23.1	46.3	S	33.6
424	Merchant wholesalers, nondurable goods	2.5	4.9	6.7	8.8
4241	Paper and paper product merchant wholesalers	47.0	S	S	23.3
4242	Drugs and druggists' sundries merchant wholesalers	8.8	14.8	21.2	33.2
4243	Apparel, piece goods, and notions merchant wholesalers	31.7	37.4	37.4	10.5
4244	Grocery and related product merchant wholesalers	1.6	2.1	8.3	11.1
4245	Farm product raw material merchant wholesalers	S	29.8	33.6	S
4246	Chemical and allied products merchant wholesalers	10.1	22.8	18.7	28.6
4247	Petroleum and petroleum products merchant wholesalers	26.6	29.5	S	26.0
4248	Beer, wine, and distilled alcoholic beverage merchant wholesalers	10.4	9.8	19.6	22.9
4249	Miscellaneous nondurable goods merchant wholesalers	4.5	15.9	16.4	20.9
4541	Electronic shopping and mail-order houses	7.0	22.8	33.5	9.2
45431	Fuel dealers	17.8	22.8	28.8	9.0

See footnotes at end of table.

Table B-T7a.

Estimated Coefficients of Variation for Shipment Characteristics of Temperature Controlled[1] Shipments by NAICS[2] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

NAICS code	NAICS description	Value—coefficient of variation of number	Tons—coefficient of variation of number	Ton-miles[3]—coefficient of variation of number	Average miles per shipment—coefficient of variation of number
4931[4]	Warehousing and storage	9.4	8.9	7.1	30.6
5111	Newspaper, periodical, book, and directory publishers	S	S	S	S
551114	Corporate, subsidiary, and regional managing offices	37.9	17.9	32.7	15.6

S Withheld because estimate did not meet publication standards.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] NAICS codes shown are those covered in the CFS.

[3] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[4] For tabulation and publication purposes, NAICS 484 is grouped with NAICS 4931.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-T7b.

Estimated Coefficients of Variation for Shipment Characteristics of Temperature Controlled[1] Shipments by NAICS[2] for the United States: 2017 and 2012—Con.

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

NAICS code	NAICS description	Value			Tons			Ton-miles[3]			Average miles per shipment		
		Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
		2017	2012		2017	2012		2017	2012		2017	2012	
	Total	**3.1**	**3.2**	**5.2**	**2.6**	**2.3**	**4.2**	**2.3**	**2.1**	**3.5**	**11.8**	**6.0**	**16.5**
212	Mining (except oil and gas)	47.6	S	S	23.0	33.1	79.9	S	S	S	S	25.9	S
31–33	Manufacturing	2.4	1.8	3.5	4.4	3.1	6.5	2.9	3.4	4.6	10.5	9.8	17.1
311	Food manufacturing	2.5	2.0	3.5	3.7	2.5	4.6	3.2	4.0	5.3	4.6	11.4	15.3
312	Beverage and tobacco product manufacturing	14.0	14.9	21.9	9.0	16.3	13.1	14.5	15.2	11.4	25.9	32.0	142.5
313	Textile mills	S	S	S	S	S	S	S	S	S	S	S	S
314	Textile product mills	S	S	S	S	S	S	S	S	S	S	S	S
315	Apparel manufacturing	S	S	S	S	S	S	S	S	S	S	S	S
316	Leather and allied product manufacturing	S	S	S	43.9	S	S	35.5	S	S	S	5.5	S
321	Wood product manufacturing	36.2	S	S	S	S	S	S	S	S	21.9	S	S
322	Paper manufacturing	22.4	S	S	S	S	S	S	S	S	17.1	31.7	44.5
323	Printing and related support activities	26.2	S	S	30.7	S	S	28.4	32.7	2667.2	11.1	23.2	9.1
324	Petroleum and coal products manufacturing	14.3	13.7	18.9	16.8	7.7	27.8	13.6	19.1	17.8	12.8	14.5	13.3
325	Chemical manufacturing	7.5	8.7	14.8	9.4	13.7	27.5	10.2	17.3	24.9	5.9	4.8	6.4
326	Plastics and rubber products manufacturing	9.8	18.8	22.5	18.4	36.1	44.4	16.9	34.1	30.9	18.8	8.4	9.4
327	Nonmetallic mineral product manufacturing	23.1	24.7	66.7	43.4	33.6	102.1	S	26.4	S	S	S	S
331	Primary metal manufacturing	33.1	39.6	68.8	24.0	S	S	45.0	38.3	309.3	35.5	32.7	26.4
332	Fabricated metal product manufacturing	36.1	S	S	31.6	S	S	S	S	S	23.3	S	S
333	Machinery manufacturing	20.5	S	S	20.5	S	S	23.5	S	S	13.3	20.3	28.0
334	Computer and electronic product manufacturing	S	31.4	S	43.6	S	S	32.4	S	S	10.3	11.3	11.7
335	Electrical equipment, appliance, and component manufacturing	31.6	23.5	597.6	46.6	19.6	3018.2	43.9	18.7	2726.9	24.4	3.6	19.4
336	Transportation equipment manufacturing	35.9	S	S	S	44.7	S	S	35.1	S	S	22.5	S
337	Furniture and related product manufacturing	S	S	S	S	S	S	S	S	S	40.6	S	S
339	Miscellaneous manufacturing	29.2	19.6	22.0	29.0	41.3	21.5	31.8	32.0	28.9	15.6	36.0	81.3
42	Wholesale trade	2.7	5.1	7.0	5.0	3.8	7.8	6.5	6.7	12.3	8.4	6.1	10.0
423	Merchant wholesalers, durable goods	21.6	18.6	58.0	16.6	20.5	97.7	28.4	34.5	78.0	21.1	7.3	11.8
4231	Motor vehicle and motor vehicle parts and supplies merchant wholesalers	44.4	S	S	S	S	S	S	S	S	28.3	S	S
4232	Furniture and home furnishing merchant wholesalers	34.5	S	S	S	S	S	S	S	S	S	40.2	S
4233	Lumber and other construction materials merchant wholesalers	33.7	42.7	85.7	33.8	45.3	353.2	33.2	S	S	38.2	38.9	12.5
4234	Professional and commercial equipment and supplies merchant wholesalers	28.2	16.9	63.1	28.4	27.1	43.7	46.6	40.1	74.5	22.8	6.1	14.4
4235	Metal and mineral (except petroleum) merchant wholesalers	34.7	38.8	3.7	43.7	38.9	1.0	40.5	40.4	2.3	46.3	S	S
4236	Electrical and electronic goods merchant wholesalers	S	S	S	S	S	S	S	S	S	31.1	46.4	396.3
4237	Hardware, plumbing and heating equipment and supplies merchant wholesalers	32.8	S	S	47.7	S	S	S	S	S	S	S	S

See footnotes at end of table.

Table B-T7b.

Estimated Coefficients of Variation for Shipment Characteristics of Temperature Controlled[1] Shipments by NAICS[2] for the United States: 2017 and 2012—Con.

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

NAICS code	NAICS description	Value			Tons			Ton-miles[3]			Average miles per shipment		
		Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
		2017	2012		2017	2012		2017	2012		2017	2012	
4238	Machinery, equipment, and supplies merchant wholesalers	24.3	49.7	161.5	36.6	S	S	42.2	S	S	18.1	S	S
4239	Miscellaneous durable goods merchant wholesalers	23.1	S	S	46.3	S	S	S	S	S	33.6	S	S
424	Merchant wholesalers, nondurable goods	2.5	5.0	6.7	4.9	3.9	7.6	6.7	6.5	12.2	8.8	6.4	11.7
4241	Paper and paper product merchant wholesalers	47.0	31.0	98.0	S	37.6	S	S	31.4	S	23.3	S	S
4242	Drugs and druggists' sundries merchant wholesalers	8.8	15.0	20.8	14.8	16.4	22.6	21.2	29.7	37.9	33.2	13.1	34.3
4243	Apparel, piece goods, and notions merchant wholesalers	31.7	S	S	37.4	S	S	37.4	S	S	10.5	S	S
4244	Grocery and related product merchant wholesalers	1.6	2.9	4.2	2.1	3.3	4.5	8.3	6.3	13.6	11.1	5.6	14.4
4245	Farm product raw material merchant wholesalers	S	30.8	S	29.8	48.7	100.4	33.6	32.5	188.8	S	23.5	S
4246	Chemical and allied products merchant wholesalers	10.1	20.8	98.2	22.8	22.1	225.9	18.7	21.9	141.0	28.6	S	S
4247	Petroleum and petroleum products merchant wholesalers	26.6	31.1	25.8	29.5	28.6	39.2	S	32.8	S	26.0	36.5	45.9
4248	Beer, wine, and distilled alcoholic beverage merchant wholesalers	10.4	8.5	23.5	9.8	9.7	22.6	19.6	27.8	40.8	22.9	10.5	41.4
4249	Miscellaneous nondurable goods merchant wholesalers	4.5	7.1	4.7	15.9	14.5	20.3	16.4	21.9	14.5	20.9	20.4	29.5
4541	Electronic shopping and mail-order houses	7.0	13.7	25.6	22.8	40.8	21.5	33.5	44.3	79.5	9.2	32.4	67.2
45431	Fuel dealers	17.8	18.1	26.9	22.8	17.2	49.5	28.8	17.5	57.5	9.0	10.3	12.5
4931[4]	Warehousing and storage	9.4	7.9	15.9	8.9	6.9	13.6	7.1	9.2	14.6	30.6	14.6	25.6
5111	Newspaper, periodical, book, and directory publishers	S	S	S	S	S	S	S	S	S	S	S	S
551114	Corporate, subsidiary, and regional managing offices	37.9	29.7	32.8	17.9	44.6	28.9	32.7	41.9	61.8	15.6	28.8	65.9

S Withheld because estimate did not meet publication standards.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] NAICS codes shown are those covered in the Commodity Flow Survey.

[3] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[4] For tabulation and publication purposes, NAICS 484 is grouped with NAICS 4931.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-T8.

Estimated Coefficients of Variation for Shipment Characteristics of Temperature Controlled[1] Shipments by Origin State: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Origin state	Value—coefficient of variation of number	Tons—coefficient of variation of number	Ton-miles[2]—coefficient of variation of number	Average miles per shipment—coefficient of variation of number
Total	**3.1**	**2.6**	**2.3**	**11.8**
Alabama	16.7	22.9	6.8	10.9
Alaska	16.2	24.8	43.1	24.4
Arizona	6.4	16.3	14.2	13.5
Arkansas	5.8	15.3	11.0	23.2
California	5.8	4.9	6.8	19.2
Colorado	9.9	27.6	18.6	17.4
Connecticut	19.3	16.1	18.8	24.1
Delaware	31.5	S	21.1	38.4
District of Columbia	37.7	32.6	S	S
Florida	8.2	10.7	12.1	22.6
Georgia	6.9	8.0	6.0	13.6
Hawaii	11.1	11.5	37.1	33.7
Idaho	14.4	25.5	31.5	S
Illinois	7.7	12.0	19.4	23.8
Indiana	23.7	16.0	14.4	12.5
Iowa	11.2	11.1	14.4	13.1
Kansas	11.9	10.9	15.8	21.0
Kentucky	8.0	16.2	11.0	25.8
Louisiana	8.5	16.2	14.2	25.9
Maine	13.8	18.8	19.8	28.3
Maryland	6.5	16.1	30.9	10.6
Massachusetts	11.4	32.9	28.4	33.1
Michigan	5.3	10.7	10.7	12.9
Minnesota	12.2	12.7	11.1	21.0
Mississippi	37.1	12.2	18.3	14.9
Missouri	38.4	12.1	9.3	17.2
Montana	14.7	20.0	30.0	42.7
Nebraska	6.8	7.6	4.4	14.9
Nevada	12.4	14.9	27.7	29.6
New Hampshire	31.1	24.9	31.2	22.4
New Jersey	9.2	8.4	12.2	21.8
New Mexico	13.6	24.6	17.8	14.3
New York	10.5	9.8	22.0	14.0
North Carolina	8.8	7.6	7.5	20.0
North Dakota	13.2	12.0	22.3	7.7
Ohio	7.9	7.8	7.6	13.0
Oklahoma	10.7	14.1	14.9	12.1
Oregon	11.1	10.5	12.7	22.9
Pennsylvania	9.0	6.7	8.9	24.3
Rhode Island	39.7	17.1	38.0	S
South Carolina	5.0	8.1	14.3	7.3
South Dakota	13.5	11.1	30.4	29.5
Tennessee	17.7	12.8	10.9	24.5
Texas	7.8	13.6	15.5	17.7
Utah	6.8	12.3	7.4	37.4
Vermont	25.9	18.7	18.6	18.0
Virginia	33.3	10.2	7.0	15.7
Washington	10.2	15.0	17.3	37.6
West Virginia	20.2	42.4	19.2	32.6
Wisconsin	5.8	7.1	9.9	8.1
Wyoming	37.2	33.5	S	23.3

S Withheld because estimate did not meet publication standards.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-T9.

Estimated Coefficients of Variation for Shipment Characteristics of Temperature Controlled[1] Shipments by Destination State: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Destination state	Value—coefficient of variation of number	Tons—coefficient of variation of number	Ton-miles[2]—coefficient of variation of number	Average miles per shipment—coefficient of variation of number
Total	**3.1**	**2.6**	**2.3**	**11.8**
Alabama	11.5	25.0	7.6	21.7
Alaska	10.8	18.1	29.4	19.6
Arizona	6.0	13.8	6.7	20.9
Arkansas	4.7	10.7	4.5	16.7
California	5.4	4.7	4.2	14.9
Colorado	6.5	27.7	10.9	18.7
Connecticut	12.3	16.1	19.2	48.6
Delaware	35.3	S	20.8	29.1
District of Columbia	S	9.9	22.0	35.3
Florida	7.8	7.8	4.5	20.1
Georgia	7.7	7.8	6.3	23.3
Hawaii	19.1	7.4	17.9	12.5
Idaho	7.9	19.3	11.1	22.2
Illinois	5.2	5.0	4.5	23.8
Indiana	9.3	9.2	6.1	21.8
Iowa	4.8	9.5	7.4	12.8
Kansas	5.5	5.8	7.7	20.7
Kentucky	15.3	11.5	8.8	27.1
Louisiana	6.0	19.0	20.1	37.7
Maine	11.2	30.6	29.8	21.4
Maryland	17.4	10.3	13.0	22.6
Massachusetts	10.8	15.7	5.7	44.5
Michigan	10.8	8.7	9.6	20.1
Minnesota	9.9	10.8	8.3	22.8
Mississippi	6.0	10.9	14.3	13.0
Missouri	7.2	17.0	5.6	28.3
Montana	8.8	8.8	16.6	12.4
Nebraska	14.3	12.5	10.6	22.9
Nevada	8.6	8.5	15.6	15.5
New Hampshire	13.7	16.2	18.6	30.2
New Jersey	10.7	5.6	9.9	20.2
New Mexico	16.7	27.2	8.7	27.5
New York	6.9	5.5	3.9	18.3
North Carolina	6.7	7.7	5.7	16.8
North Dakota	11.1	24.0	17.3	26.6
Ohio	4.7	9.3	11.3	23.6
Oklahoma	8.4	11.2	10.1	15.0
Oregon	9.8	8.9	10.7	15.8
Pennsylvania	8.1	5.0	9.3	14.4
Rhode Island	15.1	11.5	33.5	30.4
South Carolina	6.9	6.3	9.8	29.4
South Dakota	6.1	16.8	11.7	13.5
Tennessee	8.8	11.9	7.0	15.4
Texas	7.0	10.8	7.2	7.7
Utah	11.6	8.6	5.6	14.3
Vermont	9.1	14.8	18.5	34.1
Virginia	15.0	6.7	6.4	25.2
Washington	7.6	14.1	11.0	37.2
West Virginia	11.3	31.4	11.9	18.1
Wisconsin	4.9	4.4	9.4	14.7
Wyoming	23.0	12.3	18.4	12.0

S Withheld because estimate did not meet publication standards.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Reliability of the Estimates for Exports Series

Table B-E1a.

Estimated Measures of Reliability for Export Shipment Characteristics by Export Mode of Transportation: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Export mode of transportation	Value		Tons		Ton-miles	
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
All modes	**1.4**	**0.0**	**2.8**	**0.0**	**4.0**	**0.0**
Truck[1]	1.7	0.3	7.0	0.8	5.0	0.9
For-hire truck	1.8	0.3	5.7	0.7	5.2	0.7
Company-owned truck	18.0	0.3	30.1	0.3	19.6	0.2
Rail	7.1	0.2	7.5	0.8	8.0	1.7
Water	3.1	0.8	2.9	0.9	5.3	1.7
Air (included truck and air)	2.7	0.9	6.9	0.1	8.9	0.2
Pipeline[2]	S	S	S	S	S	S
Parcel, U.S. Postal Service, or courier	5.5	0.5	9.6	Z	7.8	Z

S Withheld because estimate did not meet publication standards.
Z Rounds to zero.
[1] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.
[2] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-E1b.

Estimated Measures of Reliability for Export Shipment Characteristics by Export Mode of Transportation: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

Export mode of transportation	Value			Tons			Ton-miles		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012		2017	2012	
All modes	**1.4**	**2.0**	**2.3**	**2.8**	**10.4**	**11.1**	**4.0**	**6.0**	**7.5**
Truck[1]	1.7	5.0	4.8	7.0	7.7	10.8	5.0	4.8	5.5
For-hire truck	1.8	2.7	3.4	5.7	4.6	9.5	5.2	4.7	6.3
Company-owned truck	18.0	23.1	9.8	30.1	20.1	13.3	19.6	9.8	5.5
Rail	7.1	15.2	12.6	7.5	7.4	13.9	8.0	6.8	15.1
Water	3.1	2.7	3.4	2.9	13.9	14.1	5.3	10.2	11.3
Air (included truck and air)	2.7	4.4	4.7	6.9	7.7	16.3	8.9	13.3	24.2
Pipeline[2]	S	S	S	S	S	S	S	S	S
Parcel, U.S. Postal Service, or courier	5.5	7.9	58.5	9.6	6.7	51.3	7.8	10.8	42.7

S Withheld because estimate did not meet publication standards.
[1] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.
[2] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-E2a.

Estimated Measures of Reliability for Export Shipment Characteristics by Domestic Mode of Transportation: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Domestic mode of transportation	Value		Tons		Ton-miles[1]	
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
All modes	**1.4**	**0.0**	**2.8**	**0.0**	**4.0**	**0.0**
Single modes	**1.3**	**0.9**	**6.5**	**2.5**	**5.1**	**1.8**
Truck[2]	1.7	0.3	7.0	0.8	5.0	0.9
For-hire truck	1.8	0.3	6.1	0.7	5.0	0.9
Company-owned truck	30.2	0.3	33.6	0.3	24.6	Z
Rail	8.8	0.2	8.6	0.8	8.8	1.7
Water	8.6	0.6	9.7	2.7	16.2	1.6
Inland water	S	S	S	S	S	S
Great Lakes	S	S	S	S	S	S
Deep sea	8.8	0.6	10.2	2.6	16.3	1.1
Multiple waterways	31.1	0.1	27.2	0.9	30.5	1.1
Air (includes truck and air)	2.7	0.9	6.9	0.1	8.9	0.2
Pipeline[3]	S	S	S	S	S	S
Multiple modes	**3.4**	**0.9**	**4.4**	**2.5**	**5.6**	**1.8**
Parcel, U.S. Postal Service, or courier	5.5	0.5	9.6	Z	7.8	Z
Truck and rail	27.5	0.1	31.1	0.2	31.9	0.7
Truck and water	3.0	0.6	7.8	1.6	5.9	0.9
Rail and water	18.2	0.7	10.3	2.3	9.5	2.1
Other multiple modes	8.7	0.1	15.9	0.2	13.4	0.5

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[2] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[3] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-E2b.

Estimated Measures of Reliability for Export Shipment Characteristics by Domestic Mode of Transportation: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

Domestic mode of transportation	Value			Tons			Ton-miles[1]		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012		2017	2012	
All modes	**1.4**	**2.0**	**2.3**	**2.8**	**10.4**	**11.1**	**4.0**	**6.0**	**7.5**
Single modes	**1.3**	**2.4**	**2.0**	**6.5**	**11.0**	**8.7**	**5.1**	**6.1**	**4.9**
Truck[2]	1.7	4.1	1.8	7.0	5.2	3.0	5.0	3.3	2.6
For-hire truck	1.8	3.4	1.6	6.1	6.8	3.9	5.0	3.1	2.7
Company-owned truck	30.2	14.2	5.9	33.6	15.2	4.5	24.6	25.7	3.3
Rail	8.8	11.4	6.0	8.6	23.9	10.9	8.8	12.7	9.3
Water	8.6	21.4	27.7	9.7	11.1	23.3	16.2	23.4	37.2
Inland water	S	S	S	S	S	S	S	S	S
Great Lakes	S	47.8	S	S	40.8	S	S	S	S
Deep sea	8.8	39.2	86.6	10.2	30.2	102.6	16.3	41.3	735.0
Multiple waterways	31.1	41.4	35.9	27.2	39.7	57.0	30.5	36.3	32.9
Air (includes truck and air)	2.7	5.7	8.2	6.9	6.7	17.4	8.9	14.3	29.1
Pipeline[3]	S	45.3	S	S	47.1	S	S	S	S
Multiple modes	**3.4**	**3.9**	**10.7**	**4.4**	**23.7**	**105.4**	**5.6**	**15.1**	**71.0**
Parcel, U.S. Postal Service, or courier	5.5	4.4	6.5	9.6	14.3	21.9	7.8	15.5	19.4
Truck and rail	27.5	8.8	2.1	31.1	27.4	3.9	31.9	16.5	9.3
Truck and water	3.0	13.6	413.2	7.8	28.1	1218.0	5.9	22.0	362.5
Rail and water	18.2	32.8	1332.8	10.3	S	S	9.5	S	S
Other multiple modes	8.7	10.2	710.8	15.9	9.3	62.5	13.4	9.3	92.0

S Withheld because estimate did not meet publication standards.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[2] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[3] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-E3.

Estimated Measures of Reliability for Export Shipment Characteristics by Domestic Mode Share: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Domestic mode to Port of Exit (POE)[1]	Value		Tons		Ton-miles[2]	
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
Water export mode total	**3.1**	**0.0**	**2.9**	**0.0**	**5.3**	**0.0**
Truck[3]	3.0	2.3	8.6	2.3	6.1	2.3
Rail	18.5	1.7	11.3	3.1	10.6	3.7
Truck and rail	8.7	0.4	16.0	0.3	13.4	1.0
Water	13.1	1.4	11.7	3.5	17.8	2.5
Truck and water	16.3	0.3	22.6	0.3	19.0	0.3
Rail and water	S	S	47.4	2.3	S	S
Air export mode total	**2.7**	**0.0**	**6.9**	**0.0**	**8.9**	**0.0**
Truck[3]	3.3	1.3	12.2	3.4	12.2	2.3
Air (including truck and air)	5.5	1.4	7.5	3.4	10.0	2.3
Rail export mode total	**7.1**	**0.0**	**7.5**	**0.0**	**8.0**	**0.0**
Rail	8.9	3.5	8.6	1.9	8.8	2.5
Truck and rail	27.9	3.5	31.1	1.9	32.0	2.5

S Withheld because estimate did not meet publication standards.

[1] Listed under each export mode total row are the domestic modes used for transportation to the Port of Exit (POE).

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-E4a.

Estimated Measures of Reliability for Export Shipment Characteristics by Country of Destination: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Country of destination	Value		Tons	
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
Total	**1.4**	**0.0**	**2.8**	**0.0**
Canada	3.0	0.5	5.3	1.0
Mexico	4.9	0.5	10.3	1.6
Rest of Americas	6.2	0.7	15.4	2.1
Europe and Africa	4.2	0.9	9.9	1.5
Asia and Oceania	3.1	0.8	9.6	3.2

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-E4b.

Estimated Measures of Reliability for Export Shipment Characteristics by Country of Destination: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

Country of destination	Value			Tons		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012	
Total	**1.4**	**2.0**	**2.3**	**2.8**	**10.4**	**11.1**
Canada	3.0	4.7	5.1	5.3	6.4	9.6
Mexico	4.9	5.6	7.7	10.3	11.2	19.4
All other countries	1.7	2.7	3.1	3.7	13.9	13.8

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-E5a.

Estimated Measures of Reliability for Export Shipment Characteristics by Export Mode of Transportation and Country of Destination: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Export mode of transportation and country of destination	Value		Tons	
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
Total	**1.4**	**0.0**	**2.8**	**0.0**
CANADA				
All modes	**3.0**	**0.0**	**5.3**	**0.0**
Truck[1]	3.0	1.5	6.5	2.5
For-hire truck	3.0	1.4	5.8	2.0
Company-owned truck	8.5	0.3	33.3	1.4
Rail	10.8	1.1	6.8	2.6
Water	42.8	0.5	25.3	3.2
Air (included truck and air)	5.9	0.5	15.3	0.2
Pipeline[2]	S	S	S	S
Parcel, U.S. Postal Serivice, or courier	7.5	0.7	8.1	Z
MEXICO				
All modes	**4.9**	**0.0**	**10.3**	**0.0**
Truck[1]	6.0	2.4	14.0	2.5
For-hire truck	3.0	2.1	11.7	2.4
Company-owned truck	37.9	2.1	39.0	0.7
Rail	8.4	0.8	16.2	5.4
Water	21.0	2.5	21.9	5.1
Air (included truck and air)	10.6	0.8	32.1	0.2
Pipeline[2]	S	S	S	S
Parcel, U.S. Postal Serivice, or courier	8.9	0.3	14.8	Z
REST OF AMERICAS				
All modes	**6.2**	**0.0**	**15.4**	**0.0**
Water	5.9	2.3	15.7	0.7
Air (included truck and air)	11.7	2.1	18.8	0.7
Parcel, U.S. Postal Serivice, or courier	15.2	1.2	11.5	Z
EUROPE AND AFRICA				
All modes	**4.2**	**0.0**	**9.9**	**0.0**
Water	5.6	1.4	10.0	0.2
Air (included truck and air)	6.1	1.7	16.7	0.2
Parcel, U.S. Postal Serivice, or courier	6.7	0.8	4.5	Z
ASIA AND OCEANIA				
All modes	**3.1**	**0.0**	**9.6**	**0.0**
Water	4.5	1.5	9.7	0.1
Air (included truck and air)	4.0	1.3	6.8	0.1
Parcel, U.S. Postal Serivice, or courier	8.1	0.8	23.1	0.1

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[2] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-E5b.

Estimated Measures of Reliability for Export Shipment Characteristics by Export Mode of Transportation and Country of Destination: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

Export mode of transportation and country of destination	Value			Tons		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012	
Total	**1.4**	**2.0**	**2.3**	**2.8**	**10.4**	**11.1**
CANADA						
All modes	**3.0**	**4.7**	**5.1**	**5.3**	**6.4**	**9.6**
Truck[1]	3.0	6.6	6.0	6.5	6.0	8.7
For-hire truck	3.0	3.5	4.5	5.8	5.1	9.0
Company-owned truck	8.5	28.7	6.2	33.3	19.1	15.9
Rail	10.8	18.9	17.3	6.8	15.5	24.6
Water	42.8	20.1	33.4	25.3	23.1	36.9
Air (included truck and air)	5.9	9.4	15.5	15.3	30.6	224.5
Pipeline[2]	S	S	S	S	S	S
Parcel, U.S. Postal Service, or courier	7.5	9.2	18.4	8.1	8.1	18.6
MEXICO						
All modes	**4.9**	**5.6**	**7.7**	**10.3**	**11.2**	**19.4**
Truck[1]	6.0	4.0	7.8	14.0	15.7	23.9
For-hire truck	3.0	3.7	5.6	11.7	8.3	24.3
Company-owned truck	37.9	14.1	28.4	39.0	28.8	15.0
Rail	8.4	12.3	10.2	16.2	9.8	22.8
Water	21.0	28.5	41.8	21.9	30.3	63.3
Air (included truck and air)	10.6	16.0	30.1	32.1	28.4	461.2
Pipeline[2]	S	S	S	S	S	S
Parcel, U.S. Postal Service, or courier	8.9	11.8	21.6	14.8	18.7	39.1
ALL OTHER COUNTRIES						
All modes	**1.7**	**2.7**	**3.1**	**3.7**	**13.9**	**13.8**
Water	3.3	2.4	3.3	3.7	14.1	13.9
Air (included truck and air)	2.7	4.5	4.7	8.5	8.5	13.8
Parcel, U.S. Postal Service, or courier	6.4	S	S	14.6	S	S

S Withheld because estimate did not meet publication standards.

[1] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[2] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-E6a.

Estimated Measures of Reliability for Export Shipment Characteristics by Two-Digit Commodity: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

SCTG code	Commodity description	Value		Tons		Ton-miles	
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
	All commodities[1]	**1.4**	**0.0**	**2.8**	**0.0**	**4.0**	**0.0**
01	Live animals and live fish	35.7	Z	16.5	Z	29.8	Z
02	Cereal grains (includes seed)	11.0	0.2	11.5	1.7	20.8	2.2
03	Agricultural products (excludes animal feed, cereal grains, and forage products)	13.1	0.3	18.8	1.2	17.8	1.5
04	Animal feed, eggs, honey, and other products of animal origin	13.9	0.1	12.4	0.3	19.7	0.6
05	Meat, poultry, fish, seafood, and their preparations	8.6	0.1	9.2	0.1	12.3	0.2
06	Milled grain products and preparations and bakery products	8.8	Z	28.2	0.3	26.5	0.4
07	Other prepared foodstuffs and fats and oils	7.9	0.1	11.8	0.3	20.7	0.7
08	Alcoholic beverages, and denatured alcohol	7.4	Z	13.4	0.1	13.6	0.1
09	Tobacco products	36.8	Z	42.4	Z	S	S
10	Monumental or building stone	36.7	Z	36.0	Z	39.2	Z
11	Natural sands	35.1	Z	32.1	0.7	25.5	0.5
12	Gravel and crushed stone (excludes dolomite and slate)	23.0	Z	29.1	0.1	33.1	0.1
13	Other nonmetallic minerals, n.e.c.	7.3	Z	15.8	0.3	32.3	0.8
14	Metallic ores and concentrates	24.7	0.2	32.5	1.0	43.9	1.8
15	Coal	16.3	0.1	16.3	2.4	13.8	2.4
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	42.8	0.5	39.2	1.5	42.5	0.4
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	23.1	0.5	29.7	1.6	34.0	0.4
19	Other coal and petroleum products, n.e.c.	20.1	0.1	21.1	0.7	23.5	0.4
20	Basic chemicals	14.7	0.5	19.8	0.8	9.8	0.4
21	Pharmaceutical products	13.4	0.6	38.1	0.1	36.7	0.1
22	Fertilizers	30.7	0.1	42.0	0.6	22.3	0.3
23	Chemical products and preparations, n.e.c.	6.4	0.2	14.9	0.3	17.9	0.4
24	Plastics and rubber	4.7	0.2	6.9	0.2	8.8	0.4
25	Logs and other wood in the rough	23.4	Z	29.3	0.1	16.6	0.1
26	Wood products	11.1	0.1	23.4	0.5	27.5	0.6
27	Pulp, newsprint, paper, and paperboard	6.1	0.1	5.2	0.1	11.1	0.2
28	Paper or paperboard articles	8.4	Z	20.1	0.1	20.2	0.1
29	Printed products	21.1	0.1	9.1	Z	8.5	Z
30	Textiles, leather, and articles of textiles or leather	9.5	0.2	12.9	0.1	11.0	0.1
31	Nonmetallic mineral products	5.6	Z	27.0	0.4	8.8	0.1
32	Base metal in primary or semifinished forms and in finished basic shapes	4.1	0.1	8.2	0.2	12.1	0.3
33	Articles of base metal	8.2	0.2	16.9	0.2	17.2	0.2
34	Machinery	4.9	0.5	16.0	0.2	14.6	0.2
35	Electronic and other electrical equipment and components and office equipment	7.8	1.2	27.1	0.2	16.9	0.2
36	Motorized and other vehicles (including parts)	13.7	1.4	14.9	0.3	8.3	0.3
37	Transportation equipment, n.e.c.	4.6	0.3	10.9	Z	18.7	Z
38	Precision instruments and apparatus	3.7	0.2	20.6	Z	36.5	0.2
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	28.6	0.2	23.1	Z	12.4	Z
40	Miscellaneous manufactured products	6.4	0.3	9.2	Z	9.8	0.1
41	Waste and scrap	12.0	0.2	18.0	1.7	12.6	0.4
43	Mixed freight	15.0	0.2	19.1	0.1	12.8	0.1
99	Commodity unknown	X	X	X	X	S	S

S Withheld because estimate did not meet publication standards.
X Not applicable.
Z Rounds to zero.
[1] Estimates exclude shipments of crude petroleum (SCTG 16).
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-E6b.

Estimated Measures of Reliability for Export Shipment Characteristics by Two-Digit Commodity: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

SCTG code	Commodity description	Value			Tons			Ton-miles		
		Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
		2017	2012		2017	2012		2017	2012	
	All commodities[1]	**1.4**	**2.0**	**2.3**	**2.8**	**10.4**	**11.1**	**4.0**	**6.0**	**7.5**
01	Live animals and live fish	35.7	43.0	173.5	16.5	S	S	29.8	S	S
02	Cereal grains (includes seed)	11.0	18.8	18.8	11.5	20.1	33.4	20.8	27.8	59.9
03	Agricultural products (excludes animal feed, cereal grains, and forage products)	13.1	8.5	11.9	18.8	9.9	22.2	17.8	20.7	20.2
04	Animal feed, eggs, honey, and other products of animal origin	13.9	11.8	16.3	12.4	17.2	21.5	19.7	16.4	24.2
05	Meat, poultry, fish, seafood, and their preparations	8.6	8.0	10.2	9.2	5.9	9.1	12.3	10.2	10.9
06	Milled grain products and preparations and bakery products	8.8	13.3	12.8	28.2	17.2	32.1	26.5	20.0	32.3
07	Other prepared foodstuffs and fats and oils	7.9	11.1	8.8	11.8	14.9	13.8	20.7	15.9	17.4
08	Alcoholic beverages, and denatured alcohol	7.4	15.6	20.1	13.4	8.9	26.9	13.6	10.6	20.6
09	Tobacco products	36.8	39.6	128.9	42.4	33.1	111.4	S	29.1	S
10	Monumental or building stone	36.7	33.8	81.6	36.0	32.3	38.1	39.2	36.4	19.5
11	Natural sands	35.1	31.0	51.8	32.1	11.6	130.1	25.5	19.2	60.0
12	Gravel and crushed stone (excludes dolomite and slate)	23.0	28.4	74.8	29.1	S	S	33.1	S	S
13	Other nonmetallic minerals, n.e.c.	7.3	12.0	17.5	15.8	14.2	32.0	32.3	21.6	60.6
14	Metallic ores and concentrates	24.7	15.3	34.7	32.5	41.5	43.1	43.9	39.1	67.1
15	Coal	16.3	25.8	46.3	16.3	44.0	65.7	13.8	28.3	37.6
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	42.8	39.2	42.9	39.2	37.6	67.3	42.5	S	S
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	23.1	45.8	34.8	29.7	47.1	46.5	34.0	S	S
19	Other coal and petroleum products, n.e.c.	20.1	16.3	11.9	21.1	44.6	18.5	23.5	13.3	17.5
20	Basic chemicals	14.7	12.8	21.6	19.8	11.5	38.9	9.8	12.6	24.4
21	Pharmaceutical products	13.4	9.5	20.4	38.1	12.8	83.8	36.7	16.7	69.8
22	Fertilizers	30.7	S	S	42.0	S	S	22.3	19.9	42.7
23	Chemical products and preparations, n.e.c.	6.4	8.2	13.6	14.9	6.4	28.8	17.9	6.0	26.8
24	Plastics and rubber	4.7	6.8	7.1	6.9	14.7	16.7	8.8	11.3	16.1
25	Logs and other wood in the rough	23.4	S	S	29.3	41.8	97.4	16.6	21.8	122.9
26	Wood products	11.1	10.4	20.1	23.4	16.8	42.7	27.5	20.3	44.4
27	Pulp, newsprint, paper, and paperboard	6.1	11.9	9.0	5.2	14.7	11.4	11.1	11.3	11.5
28	Paper or paperboard articles	8.4	11.3	12.2	20.1	17.7	27.3	20.2	19.5	21.1
29	Printed products	21.1	14.3	20.7	9.1	S	S	8.5	15.7	8.9
30	Textiles, leather, and articles of textiles or leather	9.5	9.4	11.6	12.9	8.0	13.0	11.0	12.5	13.0
31	Nonmetallic mineral products	5.6	9.5	11.1	27.0	12.0	31.8	8.8	11.5	11.4
32	Base metal in primary or semifinished forms and in finished basic shapes	4.1	5.2	6.9	8.2	6.5	11.6	12.1	9.8	13.8
33	Articles of base metal	8.2	4.9	9.0	16.9	6.5	23.4	17.2	7.0	19.2
34	Machinery	4.9	6.7	7.7	16.0	8.2	19.1	14.6	9.7	17.1
35	Electronic and other electrical equipment and components and office equipment	7.8	9.2	10.9	27.1	8.7	39.4	16.9	14.0	25.4
36	Motorized and other vehicles (including parts)	13.7	10.4	15.8	14.9	8.5	16.1	8.3	15.5	14.6
37	Transportation equipment, n.e.c.	4.6	19.7	33.9	10.9	15.9	18.1	18.7	12.6	27.1
38	Precision instruments and apparatus	3.7	7.3	7.6	20.6	12.3	31.3	36.5	15.0	57.0
39	Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs	28.6	11.6	41.3	23.1	16.1	41.2	12.4	18.0	21.5
40	Miscellaneous manufactured products	6.4	8.1	11.4	9.2	12.8	13.8	9.8	13.5	13.4
41	Waste and scrap	12.0	24.6	13.7	18.0	19.8	20.2	12.6	27.6	15.1
43	Mixed freight	15.0	13.2	14.3	19.1	14.7	25.8	12.8	29.2	17.2
99	Commodity unknown	X	0.0	X	X	0.0	X	S	S	S

S Withheld because estimate did not meet publication standards.
X Not applicable.
[1] Estimates exclude shipments of crude petroleum (SCTG 16).
Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-E7.

Estimated Measures of Reliability for Export Shipment Characteristics by NAICS[1]: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

NAICS code	NAICS description	Value—Coefficient of variation of number	Tons—Coefficient of variation of number	Ton-miles[2]—Coefficient of variation of number
	Total	**1.4**	**2.8**	**4.0**
212	Mining (except oil and gas)	16.2	11.1	9.3
31-33	Manufacturing	2.2	6.6	5.0
311	Food manufacturing	6.8	10.2	15.0
312	Beverage and tobacco product manufacturing	12.9	11.4	12.0
313	Textile mills	9.4	17.8	14.7
314	Textile product mills	19.4	26.7	S
315	Apparel manufacturing	27.5	18.6	35.7
316	Leather and allied product manufacturing	11.3	14.7	13.1
321	Wood product manufacturing	7.0	21.8	8.8
322	Paper manufacturing	4.7	4.3	7.0
323	Printing and related support activities	13.8	11.3	15.2
324	Petroleum and coal products manufacturing	18.2	24.2	19.0
325	Chemical manufacturing	6.4	12.0	6.7
326	Plastics and rubber products manufacturing	3.7	6.0	4.6
327	Nonmetallic mineral product manufacturing	8.1	4.8	8.0
331	Primary metal manufacturing	8.0	9.5	9.8
332	Fabricated metal product manufacturing	6.6	21.1	19.7
333	Machinery manufacturing	6.9	27.1	18.6
334	Computer and electronic product manufacturing	6.3	26.4	16.8
335	Electrical equipment, appliance, and component manufacturing	7.0	11.5	15.8
336	Transportation equipment manufacturing	6.8	8.9	7.5
337	Furniture and related product manufacturing	8.2	17.4	21.8
339	Miscellaneous manufacturing	9.1	13.5	16.1
42	Wholesale trade	2.8	7.6	9.6
423	Merchant wholesalers, durable goods	3.9	11.4	11.4
4231	Motor vehicle and motor vehicle parts and supplies merchant wholesalers	11.7	42.9	8.0
4232	Furniture and home furnishing merchant wholesalers	43.3	S	24.0
4233	Lumber and other construction materials merchant wholesalers	27.2	27.0	S
4234	Professional and commercial equipment and supplies merchant wholesalers	8.5	34.7	24.3
4235	Metal and mineral (except petroleum) merchant wholesalers	10.5	36.0	33.9
4236	Electrical and electronic goods merchant wholesalers	13.3	21.9	33.3
4237	Hardware, plumbing and heating equipment and supplies merchant wholesalers	14.9	23.4	28.1
4238	Machinery, equipment, and supplies merchant wholesalers	6.2	6.4	14.7
4239	Miscellaneous durable goods merchant wholesalers	8.9	15.7	11.7
424	Merchant wholesalers, nondurable goods	7.4	11.7	15.0
4241	Paper and paper product merchant wholesalers	25.8	47.8	45.0
4242	Drugs and druggists' sundries merchant wholesalers	34.0	25.0	20.7
4243	Apparel, piece goods, and notions merchant wholesalers	26.5	42.2	44.6
4244	Grocery and related product merchant wholesalers	12.8	13.7	16.6
4245	Farm product raw material merchant wholesalers	11.1	13.4	19.9
4246	Chemical and allied products merchant wholesalers	14.4	16.8	17.8
4247	Petroleum and petroleum products merchant wholesalers	S	S	S
4248	Beer, wine, and distilled alcoholic beverage merchant wholesalers	43.6	44.1	39.6
4249	Miscellaneous nondurable goods merchant wholesalers	17.8	19.3	15.6
4541	Electronic shopping and mail-order houses	13.9	16.1	11.0
45431	Fuel dealers	S	S	S
4931[3]	Warehousing and storage	13.7	26.5	17.7
5111	Newspaper, periodical, book, and directory publishers	29.7	36.8	36.4
551114	Corporate, subsidiary, and regional managing offices	29.2	39.9	22.2

S Withheld because estimate did not meet publication standards.

[1] NAICS codes shown are those covered in the Commodity Flow Survey.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] For tabulation and publication purposes, NAICS 484 is grouped with NAICS 4931.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-E8.

Estimated Measures of Reliability for Export Shipment Characteristics by Origin State: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Origin state	Value		Tons	
	Coefficient of variation of number	Standard error of percent	Coefficient of variation of number	Standard error of percent
Total	**1.4**	**0.0**	**2.8**	**0.0**
Alabama	20.2	0.4	22.6	0.5
Alaska	S	S	S	S
Arizona	11.7	0.2	17.7	Z
Arkansas	22.6	0.1	19.6	Z
California	5.3	0.7	13.2	1.4
Colorado	7.6	0.1	31.3	0.3
Connecticut	13.1	0.2	23.0	0.1
Delaware	38.9	0.1	32.9	Z
District of Columbia	S	S	S	S
Florida	11.6	0.5	36.9	1.3
Georgia	9.9	0.2	8.2	0.2
Hawaii	24.3	Z	S	S
Idaho	34.0	0.1	29.5	Z
Illinois	6.8	0.2	13.8	0.3
Indiana	15.3	0.4	24.7	0.4
Iowa	12.0	0.1	23.2	0.3
Kansas	15.0	0.1	33.5	0.2
Kentucky	12.5	0.1	S	S
Louisiana	18.0	0.6	19.4	2.7
Maine	24.2	0.1	26.5	Z
Maryland	18.9	0.1	21.5	Z
Massachusetts	9.4	0.2	S	S
Michigan	7.7	0.3	17.2	0.3
Minnesota	10.8	0.2	29.4	1.0
Mississippi	15.3	0.1	15.4	0.2
Missouri	18.9	0.2	30.2	0.4
Montana	17.5	Z	26.1	0.5
Nebrasaka	7.9	Z	31.2	0.2
Nevada	16.0	0.2	15.8	Z
New Hampshire	12.3	Z	10.5	Z
New Jersey	6.7	0.2	12.8	0.2
New Mexico	25.3	Z	32.6	Z
New York	14.1	0.6	33.2	0.4
North Carolina	7.4	0.2	13.8	0.2
North Dakota	16.7	Z	24.6	0.2
Ohio	7.7	0.3	16.0	0.4
Oklahoma	12.3	0.1	16.2	Z
Oregon	17.6	0.3	S	S
Pennsylvania	7.6	0.2	29.5	0.9
Rhode Island	10.1	Z	30.2	Z
South Carolina	9.4	0.2	15.4	0.1
South Dakota	16.9	Z	30.4	0.1
Tennessee	9.3	0.2	8.7	0.1
Texas	9.1	1.0	14.6	2.3
Utah	14.0	0.1	23.6	0.1
Vermont	14.7	Z	28.7	0.1
Virginia	18.1	0.2	37.7	1.4
Washington	5.3	0.3	17.8	0.6
West Virginia	21.0	0.1	21.6	0.9
Wisconsin	14.4	0.3	25.0	0.6
Wyoming	21.7	Z	22.2	0.1

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Reliability of the Estimates for Hazardous Materials Series

Table B-H1a.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Mode of Transportation for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Mode of transportation	Value		Tons		Ton-miles[1]		Average miles per shipment—coefficient of variation of number
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
All modes	**3.4**	**0.0**	**4.5**	**0.0**	**4.3**	**0.0**	**11.7**
Single modes	**3.5**	**0.4**	**4.6**	**0.2**	**4.8**	**1.2**	**6.7**
Truck[2]	3.2	1.1	4.3	0.9	7.8	2.2	7.5
For-hire truck	5.5	0.7	7.1	0.9	9.8	2.0	14.2
Company-owned truck	2.3	1.2	2.1	1.0	6.8	0.6	6.8
Rail	7.4	0.2	5.4	0.2	7.7	1.1	6.7
Water	7.1	0.6	8.9	0.8	15.7	2.2	15.8
Inland water	13.4	0.6	15.2	0.8	20.5	1.4	17.9
Great Lakes	S	S	S	S	S	S	S
Deep sea	10.5	0.4	11.3	0.6	16.7	1.3	23.9
Multiple waterways	S	S	S	S	41.6	0.1	S
Air (includes truck and air)	13.4	Z	28.2	Z	23.4	Z	5.1
Pipeline[3]	7.7	1.0	7.7	1.0	S	S	S
Multiple modes	**9.3**	**0.4**	**6.7**	**0.2**	**6.6**	**1.2**	**9.7**
Parcel, U.S. Postal Service, or courier	9.9	0.1	16.2	Z	9.8	Z	10.0
Truck and rail	7.9	0.2	7.0	0.2	6.8	1.1	3.1
Truck and water	21.8	0.2	23.6	0.1	29.6	0.3	16.2
Rail and water	24.1	Z	28.6	Z	36.8	0.1	17.3
Other multiple modes	25.6	Z	27.7	Z	32.6	Z	10.8
Other modes	**S**	**S**	**S**	**S**	**S**	**S**	**S**

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[2] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[3] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-H1b.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Mode of Transportation for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

Mode of transportation	Value			Tons			Ton-miles[1]			Average miles per shipment		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012		2017	2012		2017	2012	
All modes	**3.4**	**3.1**	**3.3**	**4.5**	**3.7**	**6.7**	**4.3**	**6.2**	**9.4**	**11.7**	**7.8**	**23.3**
Single modes	**3.5**	**3.1**	**3.3**	**4.6**	**3.7**	**6.7**	**4.8**	**6.0**	**8.6**	**6.7**	**7.4**	**10.6**
Truck[2]	3.2	3.6	3.6	4.3	3.7	6.7	7.8	6.0	12.9	7.5	6.2	10.9
For-hire truck	5.5	4.5	4.6	7.1	4.9	9.2	9.8	5.0	16.4	14.2	8.3	16.8
Company-owned truck	2.3	7.6	7.0	2.1	7.5	10.5	6.8	11.2	13.1	6.8	9.1	9.6
Rail	7.4	7.7	5.3	5.4	6.2	6.7	7.7	6.9	7.5	6.7	2.9	5.8
Water	7.1	24.3	15.9	8.9	28.2	31.7	15.7	17.4	26.0	15.8	15.6	7.5
Inland water	13.4	26.3	12.5	15.2	30.6	25.9	20.5	28.7	37.1	17.9	S	S
Great Lakes	S	S	S	S	S	S	S	S	S	S	S	S
Deep sea	10.5	38.0	69.9	11.3	36.9	110.6	16.7	36.7	69.4	23.9	25.7	10.5
Multiple waterways	S	44.0	S	S	42.7	S	41.6	43.8	2.3	S	S	S
Air (includes truck and air)	13.4	12.8	20.4	28.2	29.3	39.1	23.4	38.4	33.5	5.1	8.7	12.0
Pipeline[3]	7.7	9.3	7.7	7.7	11.0	14.6	S	S	S	S	S	S
Multiple modes	**9.3**	**15.6**	**41.6**	**6.7**	**30.9**	**90.8**	**6.6**	**45.8**	**109.2**	**9.7**	**6.2**	**16.7**
Parcel, U.S. Postal Service, or courier	9.9	11.0	19.4	16.2	9.0	21.0	9.8	10.4	19.0	10.0	6.2	17.2
Truck and rail	7.9	14.5	44.3	7.0	15.6	70.7	6.8	14.0	66.2	3.1	9.2	10.2
Truck and water	21.8	S	S	23.6	S	S	29.6	S	S	16.2	14.1	8.9
Rail and water	24.1	30.6	17.6	28.6	42.5	16.5	36.8	33.3	42.3	17.3	S	S
Other multiple modes	25.6	S	S	27.7	S	S	32.6	S	S	10.8	S	S
Other modes	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**

S Withheld because estimate did not meet publication standards.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[2] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[3] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-H2a.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Hazard Class for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Hazard class and description	Value		Tons		Ton-miles[1]		Average miles per shipment—coefficient of variation of number
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
Total	**3.4**	**0.0**	**4.5**	**0.0**	**4.3**	**0.0**	**11.7**
Class 1, Explosives	10.8	0.1	9.4	Z	12.5	Z	7.4
Class 2, Gases	11.7	0.8	8.9	0.8	4.2	0.4	30.3
Class 3, Flammable and combustible liquid	4.0	1.0	4.4	1.0	5.4	1.5	13.8
Class 4, Flammable solid; spontaneously combustible material; dangerous when wet material	5.0	Z	20.6	0.2	25.4	0.5	12.3
Class 5, Oxidizers and organic peroxides	17.9	0.1	17.3	0.1	21.1	0.3	6.1
Class 6, Toxic materials and infectious substances	16.3	0.1	14.1	Z	18.7	0.2	11.5
Class 7, Radioactive material	18.3	0.1	16.8	Z	27.8	Z	13.8
Class 8, Corrosive material	5.6	0.4	17.1	0.6	13.0	1.1	10.5
Class 9, Miscellaneous hazardous material	8.8	0.4	11.0	0.2	12.9	0.8	15.8

Z Rounds to zero.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-H2b.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Hazard Class for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

Hazard class and description	Value			Tons			Ton-miles[1]			Average miles per shipment		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012		2017	2012		2017	2012	
Total	**3.4**	**3.1**	**3.3**	**4.5**	**3.7**	**6.7**	**4.3**	**6.2**	**9.4**	**11.7**	**7.8**	**23.3**
Class 1, Explosives	10.8	17.6	16.8	9.4	21.7	19.2	12.5	13.5	18.4	7.4	3.7	10.3
Class 2, Gases	11.7	5.6	11.9	8.9	4.9	14.0	4.2	9.9	9.4	30.3	10.0	116.8
Class 3, Flammable and combustible liquid	4.0	3.6	3.7	4.4	4.1	6.8	5.4	8.1	12.8	13.8	9.3	17.9
Class 4, Flammable solid; spontaneously combustible material; dangerous when wet material	5.0	14.2	14.8	20.6	13.7	61.7	25.4	28.5	50.1	12.3	24.7	23.3
Class 5, Oxidizers and organic peroxides	17.9	9.3	26.0	17.3	10.3	25.1	21.1	17.5	29.1	6.1	11.5	6.1
Class 6, Toxic materials and infectious substances	16.3	14.6	19.1	14.1	28.4	26.5	18.7	23.3	31.8	11.5	10.2	24.8
Class 7, Radioactive material	18.3	34.5	22.1	16.8	S	S	27.8	35.7	49.1	13.8	36.3	72.4
Class 8, Corrosive material	5.6	6.3	8.8	17.1	8.0	22.8	13.0	9.1	19.2	10.5	14.0	18.1
Class 9, Miscellaneous hazardous material	8.8	9.4	13.7	11.0	17.2	27.7	12.9	12.7	22.3	15.8	19.4	44.5

S Withheld because estimate did not meet publication standards.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-H3.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Hazard Division for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Hazard division and description	Value		Tons		Ton-miles[1]		Average miles per shipment—coefficient of variation of number
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
Total	**3.4**	**0.0**	**4.5**	**0.0**	**4.3**	**0.0**	**11.7**
Division 1.1, Explosives with a mass explosion hazard	8.9	Z	14.3	Z	21.3	Z	27.0
Division 1.2, Explosives with a projection hazard	41.1	Z	44.7	Z	S	S	12.2
Division 1.3, Explosives with predominantly a fire hazard	21.2	Z	21.4	Z	26.4	Z	18.5
Division 1.4, Explosives with no significant blast hazard	18.4	0.1	15.3	Z	17.1	Z	7.3
Division 1.5, Very insensitive explosives, blasting agent	21.6	Z	28.6	Z	33.3	Z	18.3
Division 1.6, Extremely insensitive explosives, no mass explosion	S	S	S	S	S	S	S
Division 2.1, Flammable gas	16.6	0.8	13.0	0.6	8.0	0.3	11.7
Division 2.2, Nonflammable, nonpoisonous compressed gas	5.2	0.1	6.2	0.2	9.4	0.4	22.4
Division 2.3, Gas poisonous by inhalation	7.7	Z	13.2	0.1	16.5	0.1	32.9
Division 4.1, Flammable solid	12.8	Z	25.3	0.2	24.4	0.3	17.0
Division 4.2, Spontaneously combustible material	20.8	Z	30.1	Z	39.9	Z	22.5
Division 4.3, Dangerous when wet material	14.2	Z	30.7	Z	42.5	0.3	14.2
Division 5.1, Oxidizer	16.2	0.1	17.4	0.1	21.0	0.3	7.0
Division 5.2, Organic peroxide	37.7	Z	29.4	Z	39.0	Z	14.1
Division 6.1, Toxic (poisonous) materials	17.1	0.1	14.0	Z	18.7	0.2	13.3
Division 6.2, Infectious substances	S	S	S	S	S	S	14.8

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Hazard classes 3, 7, 8, and 9 are not separated into divisions and therefore not applicable to this table.

Table B-H4.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics for the Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

UN/NA number	UN/NA description	Value		Tons		Ton-miles[2]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
	Total	**3.4**	**0.0**	**4.5**	**0.0**	**4.3**	**0.0**	**11.7**
	Subtotal for Selected UN/NA Numbers	**X**	**X**	**X**	**X**	**X**	**X**	**X**
1005	Ammonia, anhydrous	15.0	0.1	19.0	0.1	29.5	0.3	19.6
1017	Chlorine	10.9	Z	16.8	Z	22.2	0.1	34.6
1046	Helium, compressed	29.2	Z	43.8	Z	25.0	Z	21.2
1066	Nitrogen, compressed	17.4	Z	23.1	0.1	18.4	Z	9.3
1072	Oxygen, compressed	22.6	Z	22.2	Z	S	S	14.4
1073	Oxygen, refrigerated liquid (cryogenic liquid)	10.4	Z	12.3	Z	14.7	Z	19.7
1075	Petroleum gases, liquefied or liquefied petroleum gas	17.3	0.2	16.2	0.2	19.2	0.3	12.2
1077	Propylene see also petroleum gases, liquefied	31.1	Z	28.7	Z	28.4	Z	18.1
1086	Vinyl chloride, stabilized	15.4	Z	22.6	0.1	15.7	0.2	22.3
1114	Benzene	42.3	0.3	39.6	0.2	S	S	13.2
1145	Cyclohexane	44.8	0.1	S	S	48.6	0.2	S
1170	Ethanol or ethyl alcohol or ethanol solutions or ethyl alcohol solutions	6.3	0.1	7.0	0.1	12.5	0.6	21.4
1202	Diesel fuel, including gas oil or heating oil, light	6.9	0.4	6.8	0.5	22.0	1.9	25.2
1203	Gasoline includes gasoline mixed with ethyl alcohol, with not more than 10% alcohol	5.3	1.0	6.1	1.0	9.4	1.9	12.7
1219	Isopropanol or isopropyl alcohol	19.2	0.1	24.7	Z	34.9	Z	13.4
1223	Kerosene	33.0	0.1	36.1	0.1	41.8	0.1	11.1
1230	Methanol	16.7	Z	18.4	Z	21.7	Z	22.7
1263	Paint including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, liquid lacquer base, and paint related material including paint thinning, drying, removing or reducing compound	6.0	0.1	14.2	Z	24.7	0.1	25.7
1268	Petroleum distillates, n.o.s. or petroleum products, n.o.s.	19.2	0.3	21.2	0.4	38.7	1.1	29.0
1270	Petroleum oil	20.6	0.1	19.0	Z	33.7	0.1	28.1
1307	Xylenes	33.6	0.1	38.2	0.1	S	S	20.9
1350	Sulfur	18.6	Z	14.2	Z	30.6	Z	21.4
1789	Hydrochloric acid	20.8	Z	37.3	0.2	43.8	0.7	14.3
1791	Hypochlorite solutions	7.8	Z	12.0	0.1	17.5	0.1	10.4
1805	Phosphoric acid solution	17.3	Z	19.5	Z	33.4	0.2	17.6
1814	Potassium hydroxide, solution	14.9	Z	15.6	Z	26.7	0.1	13.6
1824	Sodium hydroxide solution	11.7	0.1	15.8	0.2	20.4	0.6	8.4
1830	Sulfuric acid with more than 51% acid	14.9	0.1	34.1	0.3	20.9	0.4	36.6
1831	Sulfuric acid, fuming	S	S	S	S	S	S	37.4
1845	Carbon dioxide, solid or dry ice	36.9	Z	46.5	Z	42.8	Z	26.0
1863	Fuel, aviation, turbine engine	14.0	0.4	13.8	0.4	26.5	0.6	34.6
1866	Resin solution, flammable	21.6	0.1	21.6	Z	23.7	0.1	10.9
1964	Hydrocarbon gas mixture, compressed, n.o.s.	26.0	Z	36.3	0.1	38.7	Z	S
1977	Nitrogen, refrigerated liquid cryogenic liquid	13.2	Z	8.2	0.1	13.3	0.1	16.5
1978	Propane, see also petroleum gases, liquefied	41.6	0.8	32.1	0.5	16.1	0.1	19.4

See footnotes at end of table.

Table B-H4.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics for the Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

UN/NA number	UN/NA description	Value		Tons		Ton-miles[2]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
1987	Alcohols, n.o.s., including denatured alcohol	6.6	0.1	7.0	0.1	10.0	0.6	12.6
1993	Flammable liquids, n.o.s., including anti-freeze, liquid, combustible liquid, n.o.s., compounds, cleaning liquid, tree killing, diesel fuel, fuel oil (no. 1, 2, 4, 5, or 6), or plastic solvent, n.o.s.	3.1	0.4	2.9	0.6	17.4	2.2	11.5
1999	Tars, liquid including road oils and cutback bitumens, including road asphalt	16.8	0.1	19.7	0.3	20.1	0.4	14.3
2014	Hydrogen peroxide, aqueous solutions with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)	17.0	Z	22.7	Z	22.3	Z	27.3
2031	Nitric acid other than red fuming	S	S	S	S	S	S	34.0
2055	Styrene monomer, stabilized	32.6	0.1	33.2	Z	38.0	0.2	22.7
2187	Carbon dioxide, refrigerated liquid	13.8	Z	19.9	0.1	40.7	0.2	22.3
2448	Sulfur, molten	33.0	Z	29.2	0.2	26.6	0.3	17.0
2672	Ammonia solution, relative density between 0.880 and 0.957 at 15 degrees C in water, with more than 10% but not more than 35% ammonia	37.2	Z	40.5	0.1	36.3	0.1	27.7
2794	Batteries, wet, filled with acid, electric storage	23.2	0.3	18.2	Z	16.6	0.1	32.7
3077	Environmentally hazardous substance, solid, n.o.s., including hazardous waste, solid, n.o.s. or other regulated substances, solid, n.o.s.	19.3	0.1	26.5	Z	38.1	0.4	11.8
3082	Environmentally hazardous substance, liquid, n.o.s., including hazardous waste, liquid, n.o.s., marine pollutants, liquid or solid, n.o.s., or other regulated substances, liquid, n.o.s	7.1	0.1	17.4	0.1	11.1	0.3	13.1
3257	Elevated temperature liquid, n.o.s., at or above 100 C and below its flash point (including molten metals, molten salts, etc.)	19.0	0.2	15.4	0.2	26.7	0.6	10.7
3264	Corrosive liquid, acidic, inorganic, n.o.s.	13.0	Z	21.5	Z	16.4	Z	13.6
3475	Ethanol and gasoline mixture or ethanol and motor spirit mixture or ethanol and petrol mixture, with more than 10% ethanol	24.0	0.1	25.2	0.1	27.0	0.4	S

S Withheld because estimate did not meet publication standards.
X Not applicable.
Z Rounds to zero.

[1] UN numbers shown had the highest estimated weight without considering sampling variability. Since an "All other UN numbers" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-H5.

Estimated Measures of Reliability for Hazardous Versus Nonhazardous Material Shipment Characteristics by Mode of Transportation for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Mode of transportation	Tons					Ton-miles[1]				
		Hazardous		Nonhazardous			Hazardous		Nonhazardous	
	Coefficient of variation of number	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
All modes	**1.3**	**4.5**	**1.0**	**1.9**	**1.0**	**1.8**	**4.3**	**0.6**	**2.2**	**0.6**
Single modes	**1.6**	**4.6**	**1.0**	**2.1**	**1.0**	**1.9**	**4.8**	**0.6**	**2.4**	**0.6**
Truck[2]	2.0	4.3	0.8	2.5	0.8	1.5	7.8	0.7	1.7	0.7
For-hire truck	2.7	7.1	1.2	3.4	1.2	1.7	9.8	0.7	1.9	0.7
Company-owned truck	1.6	2.1	0.4	1.7	0.4	1.9	6.8	1.3	2.1	1.3
Rail	5.2	5.4	0.2	5.3	0.2	4.4	7.7	0.6	4.8	0.6
Water	5.4	8.9	2.1	5.8	2.1	7.3	15.7	3.0	7.9	3.0
Inland water	7.7	15.2	3.6	7.1	3.6	6.9	20.5	2.9	7.7	2.9
Great Lakes	34.9	S	S	34.9	0.0	34.8	S	S	34.8	0.0
Deep sea	10.7	11.3	3.6	13.8	3.6	13.9	16.7	5.5	17.8	5.5
Multiple waterways	23.8	S	S	21.8	6.2	21.3	41.6	3.9	21.5	2.2
Air (includes truck and air)	8.0	28.2	0.6	7.8	0.6	11.9	23.4	0.6	12.2	0.6
Pipeline[3]	7.4	7.7	0.6	21.2	0.6	S	S	S	S	S
Multiple modes	**4.4**	**6.7**	**0.6**	**4.6**	**0.6**	**5.0**	**6.6**	**0.8**	**5.4**	**0.8**
Parcel, U.S. Postal Service, or courier	2.8	16.2	0.1	2.8	0.1	2.5	9.8	0.1	2.5	0.1
Truck and rail	6.4	7.0	0.9	6.9	0.9	4.9	6.8	0.9	5.3	0.9
Truck and water	7.1	23.6	1.6	8.2	1.6	5.1	29.6	1.9	5.9	1.9
Rail and water	8.8	28.6	0.4	8.9	0.4	13.0	36.8	0.4	13.1	0.4
Other multiple modes	16.0	27.7	1.4	16.8	1.4	13.6	32.6	0.7	13.6	0.7
Other modes	**22.8**	**S**	**S**	**22.8**	**0.0**	**15.2**	**S**	**S**	**15.2**	**0.0**

S Withheld because estimate did not meet publication standards.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[2] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[3] Estimates for pipeline exclude shipments of crude petroleum (SCTG 16).

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-H6.

Estimated Measures of Reliability for Shipment Characteristics by Selected Commodities[1] for Hazardous Materials for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

SCTG code	Commodity description	Value			Tons			Ton-miles[2]		
			Hazardous			Hazardous			Hazardous	
		Coefficient of variation of number	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Coefficient of variation of number	Standard error of percent of total
	All commodities[3]	**1.0**	**3.4**	**0.4**	**1.3**	**4.5**	**1.0**	**1.8**	**4.3**	**0.6**
	Subtotal for Selected Commodities	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	5.4	5.4	0.0	6.1	6.1	0.0	7.4	7.4	0.0
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	4.5	4.5	0.9	4.2	4.3	0.8	11.8	12.6	1.3
19	Other coal and petroleum products, n.e.c.	6.2	10.8	2.9	5.0	8.2	2.0	10.1	15.9	4.5
20	Basic chemicals	2.6	2.8	1.0	5.1	7.4	2.3	6.2	7.1	3.3
22	Fertilizers	4.9	11.2	2.0	5.7	16.9	3.0	7.6	15.7	3.4
23	Other chemical products and preparations	4.7	8.1	1.2	5.8	12.3	1.9	6.3	18.4	2.4

X Not applicable.

[1] Commodity codes shown had the highest estimated weight without considering sampling variability. Since an "All other SCTG" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] Estimates exclude shipments of crude petroleum (SCTG 16).

Notes: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions. Percentages represent the proportion of hazardous materials to the two-digit commodity total.

Table B-H7a.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Selected Commodities[1] for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

SCTG code	Commodity description	Value		Tons		Ton-miles[2]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
	All commodities[3]	**3.4**	**0.0**	**4.5**	**0.0**	**4.3**	**0.0**	**11.7**
	Subtotal for Selected Commodities	**X**	**X**	**X**	**X**	**X**	**X**	**X**
17	Gasoline, aviation turbine fuel, and ethanol (includes kerosene, and fuel alcohols)	5.4	1.2	6.1	1.2	7.4	1.9	10.6
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	4.5	0.7	4.3	0.9	12.6	2.1	10.7
19	Other coal and petroleum products, n.e.c.	10.8	0.9	8.2	0.8	15.9	1.6	16.1
20	Basic chemicals	2.8	0.3	7.4	0.5	7.1	1.3	6.5
22	Fertilizers	11.2	0.1	16.9	0.2	15.7	0.6	17.7
23	Other chemical products and preparations	8.1	0.4	12.3	0.1	18.4	0.7	9.6

X Not applicable.

[1] Commodity codes shown had the highest estimated weight without considering sampling variability. Since an "All other SCTG" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] Estimates exclude shipments of crude petroleum (SCTG 16).

Notes: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Percentages represent the proportion of hazardous materials to the two-digit commodity total.

Table B-H7b.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Selected Commodities[1] for the United States: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Surveys]

SCTG code	Commodity description	Value			Tons			Ton-miles[2]			Average miles per shipment		
		Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
		2017	2012		2017	2012		2017	2012		2017	2012	
	All commodities[3]	**3.4**	**3.1**	**3.3**	**4.5**	**3.7**	**6.7**	**4.3**	**6.2**	**9.4**	**11.7**	**7.8**	**23.3**
	Subtotal for Selected Commodities	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
17	Gasoline, aviation turbine fuel, and ethanol includes kerosene, and fuel alcohols)	5.4	4.3	4.4	6.1	4.2	8.2	7.4	9.5	17.1	10.6	10.2	14.2
18	Fuel oils (includes diesel, Bunker C, and biodiesel)	4.5	7.7	5.9	4.3	9.7	11.3	12.6	27.5	39.2	10.7	8.9	16.2
19	Other coal and petroleum products, n.e.c.	10.8	4.1	11.5	8.2	6.4	16.1	15.9	21.4	29.2	16.1	11.5	19.3
20	Basic chemicals	2.8	6.8	6.2	7.4	5.9	12.7	7.1	12.2	16.7	6.5	15.1	10.8
22	Fertilizers	11.2	9.4	9.3	16.9	8.7	20.6	15.7	14.2	17.0	17.7	21.4	20.3
23	Other chemical products and preparations	8.1	6.3	14.5	12.3	9.2	24.2	18.4	8.3	35.6	9.6	9.9	26.1

X Not applicable.

[1] Commodity codes shown had the highest estimated weight without considering sampling variability. Since an "All other SCTG" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] Estimates exclude shipments of crude petroleum (SCTG 16).

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-H8a.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Truck for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total
	Total	**3.2**	**0.8**	**0.8**	**4.3**	**0.7**	**0.7**	**7.8**	**2.0**	**2.0**
	Subtotal for Selected UN/NA Numbers	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
1005	Ammonia, anhydrous	15.6	4.9	4.9	14.2	5.0	5.0	12.7	6.8	6.8
1013	Carbon dioxide	23.1	2.7	2.7	33.2	3.6	3.6	43.0	S	2.8
1066	Nitrogen, compressed	17.7	3.3	3.3	17.1	3.2	3.2	22.6	6.3	6.3
1072	Oxygen, compressed	22.1	3.2	3.2	16.3	6.1	6.1	S	13.9	S
1073	Oxygen, refrigerated liquid (cryogenic liquid)	9.6	3.0	3.0	11.2	5.5	5.5	14.8	6.7	6.7
1075	Petroleum gases, liquefied or liquefied petroleum gas	14.4	2.8	2.8	21.1	3.8	S	33.9	9.4	9.4
1170	Ethanol or ethyl alcohol or ethanol solutions or ethyl alcohol solutions	7.9	3.2	3.2	8.0	4.8	4.8	12.9	6.2	6.2
1202	Diesel fuel, including gas oil or heating oil, light	7.2	1.0	1.0	6.3	0.9	0.9	22.3	6.2	6.2
1203	Gasoline includes gasoline mixed with ethyl alcohol, with not more than 10% alcohol	5.5	1.7	1.7	6.0	1.5	1.5	20.1	7.4	7.4
1223	Kerosene	28.8	2.1	S	31.5	2.4	S	30.9	4.8	S
1263	Paint including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, liquid lacquer base, and paint related material including paint thinning, drying, removing or reducing compound	6.1	3.6	3.6	13.5	2.2	2.2	24.8	1.1	1.1
1268	Petroleum distillates, n.o.s. or petroleum products, n.o.s.	25.4	5.2	5.2	25.4	4.9	4.9	29.0	5.8	5.8
1270	Petroleum oil	33.2	6.3	6.7	24.8	6.3	6.8	33.9	10.8	8.7
1789	Hydrochloric acid	19.1	6.0	6.0	31.7	4.6	4.6	32.3	5.2	5.2
1791	Hypochlorite solutions	7.8	3.2	3.2	12.2	3.1	3.1	12.4	4.2	4.2
1814	Potassium hydroxide, solution	15.1	4.0	4.0	17.5	3.9	3.9	23.1	2.6	2.6
1824	Sodium hydroxide solution	12.3	5.3	5.3	17.0	4.3	4.3	21.0	4.8	4.8
1830	Sulfuric acid with more than 51% acid	19.5	4.0	4.0	13.5	4.9	4.9	17.3	3.0	3.0
1845	Carbon dioxide, solid or dry ice	46.8	S	8.7	46.5	S	10.0	42.6	8.3	8.3
1863	Fuel, aviation, turbine engine	21.3	8.0	10.0	20.8	8.5	10.8	23.9	11.7	11.7
1866	Resin solution, flammable	22.3	4.0	4.0	20.7	3.7	3.7	22.8	1.6	1.6
1951	Argon, refrigerated liquid (cryogenic liquid)	11.6	5.0	5.0	10.7	5.0	5.0	17.7	4.9	4.9
1977	Nitrogen, refrigerated liquid cryogenic liquid	10.8	3.3	3.3	7.4	3.8	3.8	13.3	5.9	5.9
1978	Propane, see also petroleum gases, liquefied	46.8	1.1	1.1	38.2	0.8	0.8	28.4	4.5	4.5
1987	Alcohols, n.o.s., including denatured alcohol	6.8	4.1	4.1	7.4	3.4	3.4	8.7	4.6	4.6
1993	Flammable liquids, n.o.s., including anti-freeze, liquid, combustible liquid, n.o.s., compounds, cleaning liquid, tree killing, diesel fuel, fuel oil (no. 1, 2, 4, 5, or 6), or plastic solvent, n.o.s.	4.5	0.7	0.7	4.4	0.7	0.7	21.5	4.6	4.6
1999	Tars, liquid including road oils and cutback bitumens, including road asphalt	21.4	4.3	4.3	18.7	3.6	3.6	22.0	4.6	4.6
2031	Nitric acid other than red fuming	S	S	10.7	S	S	13.7	S	S	14.8

See footnotes at end of table.

Table B-H8a.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Truck for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total
2187	Carbon dioxide, refrigerated liquid	9.8	3.5	3.5	14.4	2.4	2.4	16.5	3.0	3.0
2448	Sulfur, molten	21.9	4.4	4.4	16.4	4.5	4.5	20.3	7.1	7.1
2672	Ammonia solution, relative density between 0.880 and 0.957 at 15 degrees C in water, with more than 10% but not more than 35% ammonia	37.5	5.6	5.6	40.9	6.9	6.9	33.2	S	9.1
2693	Bisulfites, aqueous solutions, n.o.s.	17.4	6.0	6.0	20.9	6.1	6.1	22.0	8.5	8.5
2794	Batteries, wet, filled with acid, electric storage	23.5	6.7	6.7	18.4	6.7	6.7	15.0	3.8	3.8
3082	Environmentally hazardous substance, liquid, n.o.s., including hazardous waste, liquid, n.o.s., marine pollutants, liquid or solid, n.o.s., or other regulated substances, liquid, n.o.s.	7.7	4.1	4.1	11.4	3.4	3.4	10.6	1.4	1.4
3257	Elevated temperature liquid, n.o.s., at or above 100 C and below its flash point (including molten metals, molten salts, etc.)	13.5	4.7	4.7	16.1	4.6	4.6	14.9	6.1	6.1
3264	Corrosive liquid, acidic, inorganic, n.o.s.	14.9	4.9	4.9	26.3	5.9	5.9	17.0	3.5	3.5
3475	Ethanol and gasoline mixture or ethanol and motor spirit mixture or ethanol and petrol mixture, with more than 10% ethanol	30.4	8.9	S	33.5	8.4	S	S	15.5	S

S Withheld because estimate did not meet publication standards.

X Not applicable.

[1] UN numbers shown had the highest estimated weight without considering sampling variability. Since an "All other UN numbers" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

For purposes of this table, individual shipment data are classified as either completely "interstate" or completely "intrastate." All shipments with the state of destination different from the state of origin are classified as "interstate." All shipments having the state of origin the same as the state of destination are classified as "intrastate."

Table B-H8b.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Rail for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total
	Total	**7.4**	**4.2**	**4.2**	**5.4**	**4.8**	**4.8**	**7.7**	**2.7**	**2.7**
	Subtotal for Selected UN/NA Numbers	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
1005	Ammonia, anhydrous	49.4	S	26.0	S	S	28.3	44.1	S	0.4
1010	Butadienes, stabilized or butadienes and hydrocarbon mixture, stabilized containing more than 40% butadienes	44.2	S	13.4	31.8	31.6	11.0	S	S	S
1011	Butane see also petroleum gases, liquefied	28.2	9.4	40.0	26.1	11.1	39.8	S	31.3	S
1017	Chlorine	20.8	15.1	3.4	26.8	15.3	2.5	26.6	15.4	0.2
1040	Ethylene oxide or ethylene oxide with nitrogen up to a total pressure of 1 MPa (10 bar) at 50 degrees C	21.0	23.0	13.7	21.1	23.4	13.6	44.7	31.6	2.3
1075	Petroleum gases, liquefied or liquefied petroleum gas	24.4	16.9	10.9	23.5	17.3	11.4	31.2	S	13.5
1086	Vinyl chloride, stabilized	28.5	S	2.9	34.2	S	4.0	20.1	S	0.4
1114	Benzene	35.3	22.4	13.3	35.4	22.8	13.7	37.4	20.9	9.5
1170	Ethanol or ethyl alcohol or ethanol solutions or ethyl alcohol solutions	13.2	7.0	7.0	9.0	6.1	6.1	16.9	0.6	0.6
1202	Diesel fuel, including gas oil or heating oil, light	S	S	S	S	S	S	S	S	S
1203	Gasoline includes gasoline mixed with ethyl alcohol, with not more than 10% alcohol	39.2	S	17.9	44.1	S	18.8	43.8	S	18.7
1268	Petroleum distillates, n.o.s. or petroleum products, n.o.s.	S	S	32.9	S	S	35.9	34.5	S	20.7
1270	Petroleum oil	46.6	27.9	S	42.0	25.3	S	S	S	S
1286	Rosin oil	S	S	S	S	S	S	S	S	S
1307	Xylenes	14.0	S	2.6	15.5	S	2.9	20.3	S	4.9
1789	Hydrochloric acid	38.0	S	8.6	41.2	17.4	13.1	44.8	13.4	1.6
1791	Hypochlorite solutions	21.1	S	0.0	20.9	S	0.0	29.7	S	0.0
1805	Phosphoric acid solution	29.0	2.4	3.7	30.2	2.0	3.5	29.2	S	0.9
1814	Potassium hydroxide, solution	47.2	S	14.6	25.2	15.5	22.3	35.4	S	2.6
1824	Sodium hydroxide solution	40.0	S	4.6	27.1	3.0	3.3	36.1	S	1.2
1830	Sulfuric acid with more than 51% acid	S	S	15.5	S	S	16.4	S	S	18.2
1863	Fuel, aviation, turbine engine	30.8	0.0	S	19.4	0.0	S	S	S	S
1942	Ammonium nitrate, with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	27.7	S	0.0	28.7	S	0.0	30.6	S	0.0
1964	Hydrocarbon gas mixture, compressed, n.o.s.	S	S	S	32.6	S	0.0	33.3	S	0.0
1978	Propane, see also petroleum gases, liquefied	47.4	19.2	S	26.4	13.4	21.4	47.1	26.4	0.9

See footnotes at end of table.

Table B-H8b.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Rail for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total
1987	Alcohols, n.o.s., including denatured alcohol	12.6	6.3	5.8	12.7	6.3	5.9	13.4	0.1	0.1
1993	Flammable liquids, n.o.s., including anti-freeze, liquid, combustible liquid, n.o.s., compounds, cleaning liquid, tree killing, diesel fuel, fuel oil (no. 1, 2, 4, 5, or 6), or plastic solvent, n.o.s.	17.5	10.5	10.4	28.0	11.7	S	S	10.5	S
1999	Tars, liquid including road oils and cutback bitumens, including road asphalt	19.0	9.2	S	S	S	16.1	26.1	13.8	9.0
2015	Hydrogen peroxide, stabilized or hydrogen peroxide aqueous solutions, stabilized with more than 60% hydrogen peroxide	S	S	26.4	S	S	23.8	43.3	S	16.4
2055	Styrene monomer, stabilized	36.5	S	11.7	37.9	S	10.9	45.0	S	4.8
2078	Toluene diisocyanate	17.9	S	23.3	27.8	S	26.4	S	S	1.7
2187	Carbon dioxide, refrigerated liquid	S	S	S	43.7	S	S	S	S	S
2209	Formaldehyde solutions, with not less than 25% formaldehyde	S	S	29.7	S	S	S	S	S	S
2257	Potassium	31.5	S	0.0	32.8	S	0.0	32.5	S	0.0
2312	Phenol, molten	30.2	S	0.0	24.5	S	0.0	S	S	S
2448	Sulfur, molten	38.5	26.3	S	41.2	25.2	S	41.1	18.9	3.6
3077	Environmentally hazardous substance, solid, n.o.s., including hazardous waste, solid, n.o.s. or other regulated substances, solid, n.o.s.	26.2	17.9	6.8	27.7	14.3	5.7	39.4	5.0	1.9
3082	Environmentally hazardous substance, liquid, n.o.s., including hazardous waste, liquid, n.o.s., marine pollutants, liquid or solid, n.o.s., or other regulated substances, liquid, n.o.s.	38.3	10.2	5.6	S	10.9	S	29.0	1.1	0.6
3257	Elevated temperature liquid, n.o.s., at or above 100 C and below its flash point (including molten metals, molten salts, etc.)	S	S	24.3	S	S	26.3	S	S	23.9
3475	Ethanol and gasoline mixture or ethanol and motor spirit mixture or ethanol and petrol mixture, with more than 10% ethanol	19.0	17.5	7.8	22.0	17.2	8.4	26.2	S	4.5

S Withheld because estimate did not meet publication standards.

X Not applicable.

[1] UN numbers shown had the highest estimated weight without considering sampling variability. Since an "All other UN numbers" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

For purposes of this table, individual shipment data are classified as either completely "interstate" or completely "intrastate." All shipments with the state of destination different from the state of origin are classified as "interstate." All shipments having the state of origin the same as the state of destination are classified as "intrastate."

Table B-H8c.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Water for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total
	Total	**7.1**	**3.8**	**3.8**	**8.9**	**2.9**	**2.9**	**15.7**	**4.4**	**4.4**
	Subtotal for Selected UN/NA Numbers	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
1005	Ammonia, anhydrous	S	S	68.7	S	S	69.5	S	S	84.8
1086	Vinyl chloride, stabilized	10.0	0.0	S	16.6	0.0	S	19.8	0.0	S
1090	Acetone	6.8	S	0.0	10.9	S	0.0	10.9	S	0.0
1114	Benzene	38.9	35.1	S	24.5	25.0	S	S	56.5	S
1120	Butanols	S	S	S	S	S	S	S	S	S
1145	Cyclohexane	32.3	11.6	58.6	41.6	11.2	61.5	39.1	S	50.7
1170	Ethanol or ethyl alcohol or ethanol solutions or ethyl alcohol solutions	21.2	S	0.0	19.0	S	0.0	20.6	S	0.0
1202	Diesel fuel, including gas oil or heating oil, light	23.3	5.7	S	21.3	7.1	S	46.3	18.1	6.5
1203	Gasoline includes gasoline mixed with ethyl alcohol, with not more than 10% alcohol	17.5	11.1	14.7	17.7	9.9	12.9	38.3	S	10.9
1223	Kerosene	S	S	S	S	S	S	S	S	S
1230	Methanol	36.5	0.0	S	34.1	0.0	S	42.2	0.0	S
1268	Petroleum distillates, n.o.s. or petroleum products, n.o.s.	21.7	10.0	10.7	20.0	10.6	11.0	S	15.1	S
1270	Petroleum oil	S	S	S	S	S	S	S	S	S
1301	Vinyl acetate, stabilized	33.3	1.7	S	33.1	1.7	S	S	31.1	S
1307	Xylenes	38.3	S	S	35.8	S	S	S	5.2	S
1778	Fluorosilicic acid	15.7	0.0	S	15.7	0.0	S	15.7	0.0	S
1805	Phosphoric acid solution	6.7	0.0	S	6.7	0.0	S	6.7	0.0	S
1824	Sodium hydroxide solution	34.9	9.6	24.5	30.9	7.0	S	44.0	S	S
1830	Sulfuric acid with more than 51% acid	S	S	S	S	S	S	S	S	S
1831	Sulfuric acid, fuming	S	S	S	S	S	S	S	S	S
1863	Fuel, aviation, turbine engine	24.0	5.4	6.9	22.8	5.4	6.5	35.6	S	9.8
1918	Isopropylbenzene	45.3	S	48.9	30.3	S	42.5	S	S	3.1
1962	Ethylene	13.8	0.0	S	22.7	0.0	S	20.4	0.0	S
1993	Flammable liquids, n.o.s., including anti-freeze, liquid, combustible liquid, n.o.s., compounds, cleaning liquid, tree killing, diesel fuel, fuel oil (no. 1, 2, 4, 5, or 6), or plastic solvent, n.o.s.	12.0	4.3	4.2	14.3	5.1	5.1	27.7	12.6	10.2
1999	Tars, liquid including road oils and cutback bitumens, including road asphalt	S	S	S	S	S	S	S	S	S
2055	Styrene monomer, stabilized	36.0	23.0	18.6	35.5	22.7	19.0	42.6	37.1	4.7
2448	Sulfur, molten	S	S	S	50.0	S	S	S	S	S
2789	Acetic acid, glacial or acetic acid solution, with more than 80% acid, by mass	22.4	0.0	S	21.6	0.0	S	22.7	0.0	S

See footnotes at end of table.

Table B-H8c.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Water for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total
3082	Environmentally hazardous substance, liquid, n.o.s., including hazardous waste, liquid, n.o.s., marine pollutants, liquid or solid, n.o.s., or other regulated substances, liquid, n.o.s.	S	S	S	S	S	S	S	S	S
3257	Elevated temperature liquid, n.o.s., at or above 100 C and below its flash point (including molten metals, molten salts, etc.).	34.7	24.8	S	28.4	20.9	S	S	S	S

S Withheld because estimate did not meet publication standards.

X Not applicable.

[1] UN numbers shown had the highest estimated weight without considering sampling variability. Since an "All other UN numbers" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

For purposes of this table, individual shipment data are classified as either completely "interstate" or completely "intrastate." All shipments with the state of destination different from the state of origin are classified as "interstate." All shipments having the state of origin the same as the state of destination are classified as "intrastate."

Table B-H8d.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Pipeline for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		Coefficient of variation of number	Intrastate-Standard error of percent of total	Interstate-Standard error of percent of total	Coefficient of variation of number	Intrastate-Standard error of percent of total	Interstate-Standard error of percent of total	Coefficient of variation of number	Intrastate-Standard error of percent of total	Interstate-Standard error of percent of total
	Total	**7.7**	**1.9**	**1.9**	**7.7**	**2.0**	**2.0**	**S**	**3.2**	**3.2**
	Subtotal for Selected UN/NA Numbers	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
1011	Butane see also petroleum gases, liquefied	44.7	0.0	S	42.4	0.0	S	S	S	S
1017	Chlorine	24.6	0.0	S	30.7	0.0	S	S	0.0	S
1038	Ethylene, refrigerated liquid (cryogenic liquid)	S	S	S	S	S	S	S	S	S
1040	Ethylene oxide or ethylene oxide with nitrogen up to a total pressure of 1 MPa (10 bar) at 50 degrees C	7.5	0.0	S	14.2	0.0	S	S	0.0	S
1049	Hydrogen, compressed	32.8	0.0	S	34.1	0.0	S	S	0.0	S
1066	Nitrogen, compressed	34.6	0.0	S	35.4	0.0	S	S	0.0	S
1072	Oxygen, compressed	S	S	S	S	S	S	S	0.0	S
1075	Petroleum gases, liquefied or liquefied petroleum gas	47.8	S	S	14.1	7.1	S	S	15.4	S
1077	Propylene see also petroleum gases, liquefied	38.3	0.0	S	31.4	0.0	S	S	0.0	S
1086	Vinyl chloride, stabilized	10.4	0.0	S	10.6	0.0	S	S	0.0	S
1114	Benzene	S	S	S	S	S	S	S	S	S
1202	Diesel fuel, including gas oil or heating oil, light	12.4	6.8	6.8	14.8	5.9	5.9	S	9.8	9.8
1203	Gasoline includes gasoline mixed with ethyl alcohol, with not more than 10% alcohol	10.3	2.4	2.4	10.5	2.3	2.3	S	5.7	5.7
1223	Kerosene	49.0	19.1	S	48.0	18.5	S	S	0.5	1.1
1268	Petroleum distillates, n.o.s. or petroleum products, n.o.s.	28.1	10.4	27.5	26.6	10.4	26.9	S	S	27.1
1270	Petroleum oil	30.5	6.4	S	25.9	9.7	S	S	39.2	S
1307	Xylenes	S	S	S	S	S	S	S	S	S
1824	Sodium hydroxide solution	32.8	0.0	S	41.4	0.0	S	S	0.0	S
1830	Sulfuric acid with more than 51% acid	47.4	Z	S	44.6	0.1	S	S	2.6	S
1863	Fuel, aviation, turbine engine	15.5	3.3	3.3	16.2	3.0	3.0	S	10.2	8.8
1920	Nonanes	S	S	S	S	S	S	S	S	S
1962	Ethylene	9.7	4.5	9.2	8.5	4.4	9.1	S	7.5	14.3
1964	Hydrocarbon gas mixture, compressed, n.o.s.	35.9	0.8	S	42.3	1.2	S	S	12.4	S
1965	Hydrocarbon gas mixture, liquefied, n.o.s.	40.7	0.0	S	33.9	0.0	S	S	0.0	S
1977	Nitrogen, refrigerated liquid cryogenic liquid	S	S	S	44.4	0.0	S	S	S	S
1978	Propane, see also petroleum gases, liquefied	32.3	10.5	14.4	28.6	9.7	13.3	S	S	15.0
1993	Flammable liquids, n.o.s., including anti-freeze, liquid, combustible liquid, n.o.s., compounds, cleaning liquid, tree killing, diesel fuel, fuel oil (no. 1, 2, 4, 5, or 6), or plastic solvent, n.o.s.	14.7	4.1	4.3	15.2	3.7	4.0	S	9.3	S
1999	Tars, liquid including road oils and cutback bitumens, including road asphalt	S	S	S	S	69.2	S	S	98.7	S

See footnotes at end of table.

Table B-H8d.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Pipeline for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey. Because of rounding, estimates may not be additive]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		Coefficient of variation of number	Intrastate-Standard error of percent of total	Interstate-Standard error of percent of total	Coefficient of variation of number	Intrastate-Standard error of percent of total	Interstate-Standard error of percent of total	Coefficient of variation of number	Intrastate-Standard error of percent of total	Interstate-Standard error of percent of total
2187	Carbon dioxide, refrigerated liquid	S	S	S	S	S	S	S	S	S
2398	Methyl tert-butyl ether	15.2	0.0	S	14.7	0.0	S	S	0.0	S

S Withheld because estimate did not meet publication standards.

X Not applicable.

[1] UN numbers shown had the highest estimated weight without considering sampling variability. Since an "All other UN numbers" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

For purposes of this table, individual shipment data are classified as either completely "interstate" or completely "intrastate." All shipments with the state of destination different from the state of origin are classified as "interstate." All shipments having the state of origin the same as the state of destination are classified as "intrastate."

Table B-H8e.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Truck-Rail for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		Coefficient of variation of number	Intrastate—tandard error of percent of total	Interstate—tandard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total
	Total	**7.9**	**2.3**	**2.3**	**7.0**	**1.7**	**1.7**	**6.8**	**0.2**	**0.2**
	Subtotal for Selected UN/NA Numbers	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
1005	Ammonia, anhydrous	33.9	S	3.7	S	S	S	S	S	S
1010	Butadienes, stabilized or butadienes and hydrocarbon mixture, stabilized containing more than 40% butadienes	42.8	S	3.8	44.8	S	7.3	47.3	S	2.4
1013	Carbon dioxide	45.9	S	0.0	S	S	S	S	S	S
1017	Chlorine	49.0	26.3	S	23.1	21.8	4.8	33.2	23.3	5.1
1055	Isobutylene see also petroleum gases, liquefied	14.3	S	0.0	34.0	S	0.0	21.5	S	0.0
1075	Petroleum gases, liquefied or liquefied petroleum gas	37.2	14.7	10.7	40.6	12.1	9.2	40.6	13.2	9.2
1093	Acrylonitrile, stabilized	24.0	18.3	9.6	24.6	18.0	9.6	26.8	21.3	1.6
1114	Benzene	22.9	S	2.5	22.5	S	2.7	28.9	S	2.9
1170	Ethanol or ethyl alcohol or ethanol solutions or ethyl alcohol solutions	15.9	1.7	1.4	17.0	1.7	1.4	19.3	0.5	0.4
1202	Diesel fuel, including gas oil or heating oil, light	30.1	17.3	16.2	28.7	17.1	16.0	34.4	3.9	2.4
1203	Gasoline includes gasoline mixed with ethyl alcohol, with not more than 10% alcohol	S	31.4	S	S	31.4	S	S	5.5	S
1247	Methyl methacrylate monomer, stabilized	13.3	S	0.3	20.9	S	0.2	23.5	S	Z
1268	Petroleum distillates, n.o.s. or petroleum products, n.o.s.	41.8	S	S	44.3	17.9	S	S	24.7	S
1270	Petroleum oil	49.6	S	24.9	35.4	43.8	23.1	S	72.3	S
1495	Sodium chlorate	S	S	S	S	S	S	S	S	S
1789	Hydrochloric acid	S	1.4	S	S	3.1	S	S	0.4	S
1791	Hypochlorite solutions	23.0	9.8	2.5	30.0	10.2	3.4	30.5	0.9	0.2
1805	Phosphoric acid solution	35.4	S	1.4	37.9	S	0.8	36.4	S	0.2
1814	Potassium hydroxide, solution	38.5	S	9.9	20.0	12.7	5.4	21.0	3.3	1.3
1824	Sodium hydroxide solution	24.2	5.0	4.3	25.0	5.4	4.7	26.1	1.9	1.7
1830	Sulfuric acid with more than 51% acid	21.5	4.8	4.8	25.4	8.3	8.3	26.3	S	2.8
1942	Ammonium nitrate, with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	29.5	S	0.0	26.7	S	0.0	32.6	S	0.0
1978	Propane, see also petroleum gases, liquefied	S	40.7	S	34.0	40.3	7.2	31.8	40.8	0.1
1986	Alcohols, flammable, toxic n.o.s.	S	S	S	S	S	S	S	S	S
1987	Alcohols, n.o.s., including denatured alcohol	9.1	2.9	1.9	9.9	3.2	2.2	12.5	S	0.7
1993	Flammable liquids, n.o.s., including anti-freeze, liquid, combustible liquid, n.o.s., compounds, cleaning liquid, tree killing, diesel fuel, fuel oil (no. 1, 2, 4, 5, or 6), or plastic solvent, n.o.s.	34.3	5.9	5.0	33.0	5.6	4.6	36.0	2.1	1.6

See footnotes at end of table.

Table B-H8e.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Truck-Rail for Intrastate Versus Interstate for Selected UN/NA Numbers[1] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

UN/NA number	UN/NA description	Value			Tons			Ton-miles[2]		
		Coefficient of variation of number	Intrastate—tandard error of percent of total	Interstate—tandard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total	Coefficient of variation of number	Intrastate—Standard error of percent of total	Interstate—Standard error of percent of total
1999	Tars, liquid including road oils and cutback bitumens, including road asphalt	34.4	6.6	3.6	31.8	7.9	4.7	29.7	4.7	2.4
2014	Hydrogen peroxide, aqueous solutions with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)	41.1	44.2	8.4	41.7	43.7	8.7	39.8	46.3	3.3
2055	Styrene monomer, stabilized	S	17.0	S	S	17.0	S	S	17.9	S
2187	Carbon dioxide, refrigerated liquid	S	S	S	48.0	S	0.7	44.2	S	0.6
2218	Acrylic acid, stabilized	18.1	S	3.0	31.3	S	3.0	36.1	S	1.0
2257	Potassium	34.5	S	0.0	36.7	S	0.0	26.3	S	0.0
2280	Hexamethylenediamine, solid	33.3	3.0	3.0	16.1	2.6	2.6	17.9	0.2	0.2
2312	Phenol, molten	20.7	S	15.3	21.9	S	16.1	13.3	S	3.6
2448	Sulfur, molten	36.9	1.9	1.4	28.2	2.5	1.2	28.7	0.1	Z
2672	Ammonia solution, relative density between 0.880 and 0.957 at 15 degrees C in water, with more than 10% but not more than 35% ammonia	40.7	S	0.0	36.7	S	0.0	44.6	S	0.0
3077	Environmentally hazardous substance, solid, n.o.s., including hazardous waste, solid, n.o.s. or other regulated substances, solid, n.o.s.	9.4	S	3.3	12.4	S	3.1	19.3	S	0.4
3082	Environmentally hazardous substance, liquid, n.o.s., including hazardous waste, liquid, n.o.s., marine pollutants, liquid or solid, n.o.s., or other regulated substances, liquid, n.o.s.	16.0	13.1	3.9	18.7	S	3.8	17.5	S	2.9
3257	Elevated temperature liquid, n.o.s., at or above 100 C and below its flash point (including molten metals, molten salts, etc.)	S	S	S	44.1	11.2	8.2	46.7	11.0	5.4
3475	Ethanol and gasoline mixture or ethanol and motor spirit mixture or ethanol and petrol mixture, with more than 10% ethanol	38.9	S	0.0	42.8	S	0.0	27.2	S	0.0

S Withheld because estimate did not meet publication standards.
X Not applicable.
Z Rounds to zero.

[1] UN numbers shown had the highest estimated weight without considering sampling variability. Since an "All other UN numbers" line is not shown, estimates do not add to total.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

For purposes of this table, individual shipment data are classified as either completely "interstate" or completely "intrastate." All shipments with the state of destination different from the state of origin are classified as "interstate." All shipments having the state of origin the same as the state of destination are classified as "intrastate."

Table B-H9.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics for Toxic by Inhalation (TIH) for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Description	Value		Tons		Ton-miles[1]	
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
Total	**3.4**	**0.0**	**4.5**	**0.0**	**4.3**	**0.0**
Toxic by Inhalation	6.5	Z	11.9	0.1	17.0	0.3

Z Rounds to zero.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Toxic by inhalation (TIH) gases and volatile liquids that are toxic when inhaled.

Table B-H10.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics for Packaging Group I for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Description	Value		Tons		Ton-miles[1]	
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
Total	**3.4**	**0.0**	**4.5**	**0.0**	**4.3**	**0.0**
Packaging Group I	2.6	0.7	2.5	0.7	11.6	2.9

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Notes: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Packing Groups I, II, and III reflect the level of hazard associated with the material being shipped. Packing Group I is the most rigorous.

Table B-H11a.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics for Export by Country of Destination: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Country of destination	Value		Tons		Ton-Miles[1]	
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
Total	**11.8**	**0.0**	**15.9**	**0.0**	**9.7**	**0.0**
Canada	15.1	2.7	17.3	2.7	17.8	5.7
Mexico	24.0	4.2	24.7	5.9	22.7	5.6
Rest of Americas	18.9	3.7	24.1	4.2	17.6	0.8
Europe and Africa	23.2	3.1	21.1	2.3	12.2	0.9
Asia and Oceania	14.6	2.7	44.2	5.0	34.9	5.0

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-H11b.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics for Export by Country of Destination: 2017 and 2012

[Estimates are based on data from the 2017 and 2012 Commodity Flow Survey]

Country of destination	Value			Tons			Ton-Miles[1]		
	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change	Coefficient of variation of number		Standard error of percent change
	2017	2012		2017	2012		2017	2012	
Total	**11.8**	**20.4**	**20.6**	**15.9**	**25.5**	**29.7**	**9.7**	**19.2**	**29.5**
Canada	15.1	15.3	24.4	17.3	19.6	32.9	17.8	16.9	48.2
Mexico	24.0	19.7	32.7	24.7	25.1	41.6	22.7	41.9	41.1
All other countries	12.3	26.5	22.7	17.4	35.8	33.7	22.7	11.5	41.3

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-H12.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Selected NAICS Code[1] and Mode of Transportation for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

NAICS code	NAICS description and mode of transportation	Value		Tons		Ton-miles[2]	
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
	All Sectors						
	All modes	**3.4**	**0.0**	**4.5**	**0.0**	**4.3**	**0.0**
	Single modes	**3.5**	**0.4**	**4.6**	**0.2**	**4.8**	**1.2**
	Truck[3]	3.2	1.1	4.3	0.9	7.8	2.2
	For-hire truck	5.5	0.7	7.1	0.9	9.8	2.0
	Company-owned truck	2.3	1.2	2.1	1.0	6.8	0.6
	Rail	7.4	0.2	5.4	0.2	7.7	1.1
	Water	7.1	0.6	8.9	0.8	15.7	2.2
	Inland water	13.4	0.6	15.2	0.8	20.5	1.4
	Great Lakes	S	S	S	S	S	S
	Deep sea	10.5	0.4	11.3	0.6	16.7	1.3
	Multiple waterways	S	S	S	S	41.6	0.1
	Air (includes truck and air)	13.4	Z	28.2	Z	23.4	Z
	Pipeline[4]	7.7	1.0	7.7	1.0	S	S
	Multiple modes	**9.3**	**0.4**	**6.7**	**0.2**	**6.6**	**1.2**
	Parcel, U.S. Postal Service, or courier	9.9	0.1	16.2	Z	9.8	Z
	Truck and rail	7.9	0.2	7.0	0.2	6.8	1.1
	Truck and water	21.8	0.2	23.6	0.1	29.6	0.3
	Rail and water	24.1	Z	28.6	Z	36.8	0.1
	Other multiple modes	25.6	Z	27.7	Z	32.6	Z
	Other modes	**S**	**S**	**S**	**S**	**S**	**S**
324	**Petroleum and Coal Products Manufacturing**						
	All modes	**5.3**	**0.0**	**5.3**	**0.0**	**8.8**	**0.0**
	Single modes	**5.3**	**0.2**	**5.3**	**0.2**	**7.9**	**1.4**
	Truck[3]	7.8	1.2	8.1	1.3	9.0	1.9
	For-hire truck	8.7	1.3	9.0	1.4	10.1	1.9
	Company-owned truck	10.7	0.1	12.6	0.1	21.5	0.2
	Rail	24.7	0.7	19.0	0.6	30.7	2.8
	Water	9.4	2.0	12.8	2.3	17.3	3.7
	Inland water	18.3	1.7	19.7	1.8	26.5	2.6
	Great Lakes	S	S	S	S	S	S
	Deep sea	14.3	1.5	15.3	1.5	20.4	3.1
	Multiple waterways	S	S	S	S	S	S
	Air (includes truck and air)	S	S	S	S	S	S
	Pipeline[4]	9.2	3.0	9.2	3.3	S	S
	Multiple modes	**16.0**	**0.2**	**18.6**	**0.2**	**24.2**	**1.4**
	Parcel, U.S. Postal Service, or courier	31.1	Z	27.8	Z	25.1	Z
	Truck and rail	17.5	0.1	19.5	0.2	24.4	1.4
	Truck and water	23.5	Z	33.1	Z	48.3	Z
	Rail and water	38.7	0.1	46.4	0.1	1.5	Z
	Other multiple modes	S	S	31.9	Z	15.5	Z
	Other modes	**S**	**S**	**S**	**S**	**S**	**S**
325	**Chemical Manufacturing**						
	All modes	**5.4**	**0.0**	**4.4**	**0.0**	**5.3**	**0.0**
	Single modes	**3.8**	**1.7**	**4.5**	**1.2**	**5.4**	**2.2**
	Truck[3]	3.7	1.7	5.1	1.5	6.4	0.7
	For-hire truck	4.1	1.5	5.3	1.0	6.2	0.6
	Company-owned truck	5.2	0.4	6.4	0.9	7.7	0.2
	Rail	6.8	0.9	4.2	1.1	7.0	2.3
	Water	18.1	2.2	15.5	2.4	23.6	1.8
	Inland water	15.5	1.2	15.3	1.5	18.8	0.9
	Great Lakes	S	S	S	S	S	S
	Deep sea	28.4	1.3	22.5	1.6	35.8	1.2
	Multiple waterways	13.4	0.9	23.7	0.7	S	S
	Air (includes truck and air)	20.1	0.2	43.5	Z	26.7	Z
	Pipeline[4]	31.2	1.9	24.5	2.5	S	S
	Multiple modes	**12.9**	**1.7**	**8.4**	**1.2**	**8.7**	**2.2**
	Parcel, U.S. Postal Service, or courier	14.6	0.3	15.2	Z	22.5	Z
	Truck and rail	10.3	1.1	7.9	1.1	8.9	2.3
	Truck and water	28.4	1.2	25.6	0.3	17.2	0.2
	Rail and water	34.4	0.1	26.3	Z	37.0	0.1
	Other multiple modes	26.4	Z	36.0	Z	24.1	Z
	Other modes	**S**	**S**	**S**	**S**	**S**	**S**

See footnotes at end of table.

Table B-H12.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Selected NAICS Code[1] and Mode of Transportation for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

NAICS code	NAICS description and mode of transportation	Value		Tons		Ton-miles[2]	
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
4246	**Chemical and Allied Products Merchant Wholesalers**						
	All modes	**5.3**	**0.0**	**28.7**	**0.0**	**28.6**	**0.0**
	Single modes	**5.2**	**0.2**	**27.2**	**1.0**	**20.6**	**4.5**
	Truck[3]	4.9	1.5	15.9	5.6	11.3	7.4
	For-hire truck	7.4	1.5	34.1	2.4	15.1	4.6
	Company-owned truck	4.1	1.5	6.7	6.8	8.8	3.8
	Rail	S	S	41.7	0.6	S	S
	Water	S	S	S	S	S	S
	Inland water	S	S	S	S	S	S
	Great Lakes	S	S	S	S	S	S
	Deep sea	S	S	S	S	S	S
	Multiple waterways	S	S	S	S	S	S
	Air (includes truck and air)	43.4	0.2	42.4	Z	26.9	Z
	Pipeline[4]	S	S	S	S	S	S
	Multiple modes	**8.9**	**0.2**	**S**	**S**	**S**	**S**
	Parcel, U.S. Postal Service, or courier	21.6	0.3	48.5	Z	S	S
	Truck and rail	26.9	0.2	S	S	S	S
	Truck and water	21.6	0.2	S	S	S	S
	Rail and water	S	S	S	S	S	S
	Other multiple modes	20.8	Z	S	S	19.0	Z
	Other modes	**S**	**S**	**S**	**S**	**S**	**S**
4247	**Petroleum and Petroleum Products Merchant Wholesalers**						
	All modes	**5.1**	**0.0**	**5.4**	**0.0**	**10.6**	**0.0**
	Single modes	**5.1**	**0.1**	**5.4**	**0.1**	**11.5**	**2.0**
	Truck[3]	5.0	0.7	5.2	0.6	14.2	5.7
	For-hire truck	8.3	1.6	8.6	1.6	20.2	5.5
	Company-owned truck	3.6	1.7	3.5	1.7	10.3	3.4
	Rail	29.2	0.1	46.9	0.3	S	S
	Water	30.7	0.7	26.6	0.6	S	S
	Inland water	37.7	0.7	34.8	0.6	S	S
	Great Lakes	S	S	S	S	S	S
	Deep sea	40.8	0.2	28.5	0.2	S	S
	Multiple waterways	S	S	S	S	S	S
	Air (includes truck and air)	46.5	Z	43.5	Z	48.0	0.1
	Pipeline[4]	18.7	0.3	23.0	0.3	S	S
	Multiple modes	**27.9**	**0.1**	**31.8**	**0.1**	**42.7**	**2.0**
	Parcel, U.S. Postal Service, or courier	36.1	Z	S	S	S	S
	Truck and rail	39.0	0.1	40.3	0.2	S	S
	Truck and water	39.9	Z	41.8	0.1	S	S
	Rail and water	S	S	S	S	S	S
	Other multiple modes	S	S	S	S	S	S
	Other modes	**S**	**S**	**S**	**S**	**S**	**S**
45431	**Fuel Dealers**						
	All modes	**3.2**	**0.0**	**4.6**	**0.0**	**5.0**	**0.0**
	Single modes	**3.2**	**Z**	**4.6**	**Z**	**4.9**	**0.7**
	Truck	3.2	0.1	4.6	Z	5.1	1.1
	For-hire truck	17.5	0.8	16.1	0.8	35.1	2.8
	Company-owned truck	3.3	0.8	5.1	0.8	4.9	2.6
	Rail	S	S	S	S	S	S
	Water	38.9	0.2	48.8	0.2	11.1	1.7
	Inland water	6.8	0.1	7.8	0.1	8.0	2.7
	Great Lakes	S	S	S	S	S	S
	Deep sea	S	S	S	S	S	S
	Multiple waterways	S	S	S	S	S	S
	Air (includes truck and air)	S	S	S	S	S	S
	Pipeline	13.3	Z	5.0	Z	S	S
	Multiple modes	**49.6**	**Z**	**S**	**S**	**S**	**S**
	Parcel, U.S. Postal Service, or courier	S	S	39.9	Z	S	S
	Truck and rail	S	S	S	S	S	S
	Truck and water	S	S	46.7	Z	S	S
	Rail and water	S	S	S	S	S	S
	Other multiple modes	S	S	S	S	S	S
	Other modes	**S**	**S**	**S**	**S**	**S**	**S**

See footnotes at end of table.

Table B-H12.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Selected NAICS Code[1] and Mode of Transportation for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

NAICS code	NAICS description and mode of transportation	Value		Tons		Ton-miles[2]	
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total
4931	**Warehousing and Storage**						
	All modes	**10.3**	**0.0**	**11.5**	**0.0**	**8.9**	**0.0**
	Single modes	**10.6**	**0.8**	**11.5**	**0.1**	**9.4**	**1.3**
	Truck[3]	10.9	1.3	12.3	1.3	10.1	3.8
	For-hire truck	12.6	3.6	25.7	2.5	12.0	3.6
	Company-owned truck	14.1	4.0	13.2	2.8	15.0	6.1
	Rail	S	S	S	S	S	S
	Water	26.8	0.8	25.9	1.8	S	S
	Inland water	26.8	0.8	25.9	1.8	S	S
	Great Lakes	S	S	S	S	S	S
	Deep sea	S	S	S	S	S	S
	Multiple waterways	S	S	S	S	S	S
	Air (includes truck and air)	39.8	Z	45.5	Z	S	S
	Pipeline[4]	S	S	29.1	0.8	S	S
	Multiple modes	**26.0**	**0.8**	**39.4**	**0.1**	**43.5**	**1.3**
	Parcel, U.S. Postal Service, or courier	27.8	0.3	28.9	Z	32.5	0.1
	Truck and rail	S	S	23.3	0.4	30.7	6.6
	Truck and water	38.8	0.9	S	S	S	S
	Rail and water	S	S	S	S	S	S
	Other multiple modes	S	S	S	S	S	S
	Other modes	**S**	**S**	**S**	**S**	**S**	**S**

S Withheld because estimate did not meet publication standards.
Z Rounds to zero.
[1] NAICS codes shown had the highest estimated weight without considering sampling variability and are shown in descending order.
[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.
[3] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.
[4] Estimates exclude shipments of crude petroleum (SCTG 16).
Notes: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.
NAICS codes shown are those covered in the Commodity Flow Survey.

Table B-H13.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics of Temperature Controlled[1] Shipments by Mode of Transportation for the United States: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Mode of transportation	Value		Tons		Ton-miles[2]		Average miles per shipment—coefficient of variation of number
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
All modes	**7.3**	**0.0**	**8.1**	**0.0**	**8.6**	**0.0**	**24.5**
Single modes	**7.0**	**1.9**	**8.4**	**0.9**	**10.0**	**2.0**	**6.2**
Truck[3]	6.0	4.5	7.1	4.2	6.6	5.1	5.7
For-hire truck	7.3	3.4	11.8	4.2	10.8	4.9	5.3
Company-owned truck	5.5	1.6	5.7	2.1	8.6	1.5	8.1
Rail	21.5	1.4	37.4	1.7	30.0	3.7	10.8
Water	29.4	4.0	26.9	3.9	43.3	4.0	43.9
Inland water	30.1	3.2	36.4	3.9	35.9	2.1	S
Great Lakes	S	S	S	S	S	S	S
Deep sea	37.2	3.5	33.5	4.3	S	S	47.7
Multiple waterways	S	S	S	S	S	S	S
Air (includes truck and air)	18.8	0.2	S	S	29.2	Z	16.6
Pipeline[4]	24.5	0.3	21.7	0.6	S	S	S
Multiple modes	**22.5**	**1.9**	**16.9**	**0.9**	**10.3**	**2.0**	**11.2**
Parcel, U.S. Postal Service, or courier	35.4	0.5	49.5	Z	S	S	11.7
Truck and rail	21.9	1.2	16.6	0.8	11.2	2.0	8.5
Truck and water	S	S	S	S	25.5	0.2	44.8
Rail and water	S	S	S	S	S	S	S
Other multiple modes	S	S	S	S	S	S	S
Other modes	**S**	**S**	**S**	**S**	**S**	**S**	**S**

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

[3] "Truck" as a single mode includes shipments that were made by only company-owned truck or only for-hire truck.

[4] Estimates exclude shipments of crude petroleum (SCTG 16).

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-H14.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics of Temperature Controlled[1] Shipments by Selected UN/NA Numbers[2] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

UN/NA number	UN/NA description	Value		Tons		Ton-miles[3]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
	Total	**7.3**	**0.0**	**8.1**	**0.0**	**8.6**	**0.0**	**24.5**
	Subtotal for Selected UN/NA Numbers	**X**	**X**	**X**	**X**	**X**	**X**	**X**
1005	Ammonia, anhydrous	27.5	1.4	36.4	2.3	S	S	17.5
1013	Carbon dioxide	S	S	S	S	S	S	16.0
1040	Ethylene oxide or ethylene oxide with nitrogen up to a total pressure of 1 MPa (10 bar) at 50 degrees C	47.1	0.7	S	S	15.8	0.5	23.4
1046	Helium, compressed	25.6	0.1	28.0	Z	S	S	27.7
1066	Nitrogen, compressed	18.8	0.1	19.1	0.1	35.7	0.1	12.3
1072	Oxygen, compressed	45.6	0.1	46.8	0.2	34.1	Z	26.8
1073	Oxygen, refrigerated liquid (cryogenic liquid)	10.4	0.2	12.3	0.7	14.7	0.7	19.7
1075	Petroleum gases, liquefied or liquefied petroleum gas	34.0	0.6	31.3	0.4	43.8	0.2	12.5
1086	Vinyl chloride, stabilized	19.6	0.6	19.9	0.4	S	S	S
1145	Cyclohexane	43.3	3.1	43.6	1.4	41.0	1.4	S
1170	Ethanol or ethyl alcohol or ethanol solutions or ethyl alcohol solutions	44.4	0.6	48.8	0.4	45.3	0.9	20.6
1202	Diesel fuel, including gas oil or heating oil, light	S	S	S	S	S	S	S
1230	Methanol	42.2	Z	S	S	S	S	46.5
1263	Paint including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, liquid lacquer base, and paint related material including paint thinning, drying, removing or reducing compound	15.2	0.5	15.2	Z	30.6	0.1	32.9
1268	Petroleum distillates, n.o.s. or petroleum products, n.o.s.	41.2	0.3	S	S	S	S	S
1270	Petroleum oil	S	S	S	S	S	S	15.3
1286	Rosin oil	S	S	S	S	S	S	S
1350	Sulfur	26.2	Z	20.8	0.1	36.7	Z	19.2
1789	Hydrochloric acid	44.4	Z	24.1	Z	24.8	Z	23.6
1791	Hypochlorite solutions	20.1	0.1	16.5	0.1	48.7	0.5	24.2
1805	Phosphoric acid solution	S	S	S	S	S	S	18.6
1824	Sodium hydroxide solution	41.3	0.4	49.6	0.3	S	S	34.6
1845	Carbon dioxide, solid or dry ice	36.9	0.7	46.5	0.5	42.8	0.5	26.0
1863	Fuel, aviation, turbine engine	40.1	0.5	43.0	0.5	32.6	0.3	18.4
1866	Resin solution, flammable	21.9	0.5	20.4	Z	17.0	0.1	13.9
1942	Ammonium nitrate, with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	30.9	0.3	30.9	0.6	34.5	2.8	23.6
1951	Argon, refrigerated liquid (cryogenic liquid)	12.6	0.1	12.2	0.1	16.3	0.4	16.1
1956	Compressed gas, n.o.s.	37.6	0.1	25.4	Z	40.5	0.1	28.9
1965	Hydrocarbon gas mixture, liquefied, n.o.s.	S	S	S	S	48.4	0.1	S
1966	Hydrogen, refrigerated liquid (cryogenic liquid)	S	S	37.8	0.1	48.3	0.2	16.9
1972	Methane, refrigerated liquid (cryogenic liquid) or natural gas, refrigerated liquid (cryogenic liquid), with high methane content	30.5	0.1	17.7	0.1	33.3	0.1	38.5
1977	Nitrogen, refrigerated liquid cryogenic liquid	13.2	0.5	8.2	1.1	13.3	1.4	16.5
1978	Propane, see also petroleum gases, liquefied	29.8	0.2	35.9	0.1	45.1	Z	7.9

See footnotes at end of table.

Table B-H14.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics of Temperature Controlled[1] Shipments by Selected UN/NA Numbers[2] for the United States: 2017—Con.

[Estimates are based on data from the 2017 Commodity Flow Survey]

UN/NA number	UN/NA description	Value		Tons		Ton-miles[3]		Average miles per shipment—coefficient of variation of number
		Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
1987	Alcohols, n.o.s., including denatured alcohol	16.3	0.4	18.6	0.3	31.2	1.2	16.8
1993	Flammable liquids, n.o.s., including antifreeze, liquid, combustible liquid, n.o.s., compounds, cleaning liquid, tree killing, diesel fuel, fuel oil (no. 1, 2, 4, 5, or 6), or plastic solvent, n.o.s.	42.1	1.4	S	S	26.8	0.7	29.9
1999	Tars, liquid including road oils and cutback bitumens, including road asphalt	25.1	2.2	21.3	2.9	23.7	2.5	14.4
2055	Styrene monomer, stabilized	38.9	1.7	39.6	0.6	39.2	2.6	29.4
2187	Carbon dioxide, refrigerated liquid	13.8	0.2	19.9	1.2	40.7	2.6	22.3
2209	Formaldehyde solutions, with not less than 25% formaldehyde	28.6	Z	46.2	0.1	35.2	Z	13.9
2426	Ammonium nitrate, liquid (hot concentrated solution)	19.2	Z	25.9	0.1	26.8	0.2	9.7
2448	Sulfur, molten	S	S	S	S	33.3	1.3	44.3
2672	Ammonia solution, relative density between 0.880 and 0.957 at 15 degrees C in water, with more than 10% but not more than 35% ammonia	S	S	42.1	0.3	S	S	24.6
2752	1,2-Epoxy-3-ethoxypropane	S	S	S	S	S	S	S
2785	4-Thiapentanal	41.6	0.3	41.3	0.2	41.3	0.1	Z
3077	Environmentally hazardous substance, solid, n.o.s., including hazardous waste, solid, n.o.s. or other regulated substances, solid, n.o.s.	28.9	0.2	41.4	Z	47.0	0.1	23.5
3082	Environmentally hazardous substance, liquid, n.o.s., including hazardous waste, liquid, n.o.s., marine pollutants, liquid or solid, n.o.s., or other regulated substances, liquid, n.o.s.	18.6	0.9	24.1	0.2	27.9	1.1	11.4
3256	Elevated temperature liquid, flammable, n.o.s., with flash point above 37.8 C, at or above its flash point	S	S	S	S	35.3	0.1	S
3257	Elevated temperature liquid, n.o.s., at or above 100 C and below its flash point (including molten metals, molten salts, etc.)	19.0	3.2	15.4	2.9	26.7	4.2	10.7
3265	Corrosive liquid, acidic, organic, n.o.s.	35.3	0.1	34.0	Z	46.0	0.1	13.4
3475	Ethanol and gasoline mixture or ethanol and motor spirit mixture or ethanol and petrol mixture, with more than 10% ethanol	37.8	0.7	S	S	S	S	39.7

S Withheld because estimate did not meet publication standards.
X Not applicable.
Z Rounds to zero.

[1] Shipments that are temperature controlled are transported in a vehicle or container that regulates or maintains the temperature when en route to its destination.

[2] UN numbers shown had the highest estimated weight without considering sampling variability. Since an "All other UN numbers" line is not shown, estimates do not add to total.

[3] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-H15.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Origin State: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Origin state	Value		Tons		Ton-miles[1]		Average miles per shipment—coefficient of variation of number
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
Total	**3.4**	**0.0**	**4.5**	**0.0**	**4.3**	**0.0**	**11.7**
Alabama	12.0	0.1	10.8	0.1	16.3	0.2	11.5
Alaska	16.0	0.1	18.6	0.1	42.4	0.2	22.3
Arizona	21.6	0.1	27.2	0.1	7.7	Z	35.3
Arkansas	13.3	0.1	12.2	Z	8.7	Z	29.0
California	8.4	0.7	6.9	0.4	13.4	0.5	46.5
Colorado	17.1	0.1	19.2	0.1	31.1	0.3	27.2
Connecticut	21.1	0.2	19.7	0.2	27.9	0.1	14.6
Delaware	25.9	0.1	36.9	0.1	49.2	0.2	S
District of Columbia	S	S	S	S	S	S	S
Florida	6.4	0.2	7.6	0.2	18.9	0.3	19.3
Georgia	7.8	0.2	6.7	0.1	15.5	0.1	26.5
Hawaii	16.9	0.1	21.5	0.1	11.2	Z	36.8
Idaho	13.0	Z	25.2	Z	25.8	Z	32.0
Illinois	8.8	0.5	9.3	0.5	21.8	0.9	20.4
Indiana	14.8	0.3	14.9	0.3	12.0	0.3	24.8
Iowa	6.3	0.1	9.1	0.1	8.0	0.4	23.8
Kansas	19.3	0.4	26.0	0.4	17.8	0.1	S
Kentucky	11.7	0.2	13.5	0.2	25.9	0.5	10.0
Louisiana	7.6	0.4	8.7	0.5	13.2	1.9	11.5
Maine	6.3	Z	8.6	Z	15.0	Z	22.5
Maryland	29.6	0.1	31.6	0.1	19.7	Z	46.0
Massachusetts	15.4	0.3	19.4	0.3	49.4	0.8	29.1
Michigan	13.5	0.2	15.2	0.2	14.2	0.1	26.2
Minnesota	12.2	0.2	16.9	0.4	35.6	1.8	31.1
Mississippi	22.2	0.2	19.4	0.2	16.1	0.4	19.7
Missouri	7.2	0.1	5.7	Z	12.1	0.1	15.7
Montana	17.2	0.1	23.4	0.1	24.5	0.2	35.7
Nebraska	14.1	0.1	12.8	Z	12.2	0.2	30.9
Nevada	17.5	Z	16.9	Z	46.7	0.2	21.6
New Hampshire	26.8	0.1	27.3	0.1	31.6	Z	31.7
New Jersey	13.9	0.3	24.0	0.3	20.1	0.1	13.9
New Mexico	22.3	0.1	22.7	0.1	35.2	0.4	20.2
New York	11.0	0.2	14.4	0.3	15.3	0.1	25.8
North Carolina	7.5	0.1	8.9	0.1	8.2	Z	19.3
North Dakota	20.9	0.1	25.0	0.1	28.3	0.1	17.2
Ohio	7.8	0.2	11.1	0.3	12.5	0.2	11.7
Oklahoma	9.9	0.1	11.7	0.2	25.3	0.4	23.0
Oregon	10.8	0.1	11.1	0.1	15.7	Z	19.7
Pennsylvania	9.7	0.3	8.6	0.2	14.1	0.2	12.4
Rhode Island	29.0	0.1	32.2	0.1	27.5	Z	S
South Carolina	10.9	0.1	7.2	Z	19.3	Z	34.7
South Dakota	23.1	0.1	24.7	0.1	13.0	0.2	S
Tennessee	8.4	0.1	8.3	0.2	17.0	0.2	23.6
Texas	5.5	0.9	7.9	1.2	6.6	1.3	18.8
Utah	9.9	0.1	11.4	0.1	S	S	14.5
Vermont	28.1	Z	33.3	Z	24.8	Z	28.1
Virginia	8.8	0.1	8.7	0.1	14.6	Z	48.4
Washington	13.1	0.3	13.0	0.3	23.4	0.3	27.9
West Virginia	11.3	0.1	12.0	0.1	24.9	0.1	21.4
Wisconsin	8.7	0.1	8.6	0.1	14.9	0.2	12.6
Wyoming	11.3	Z	12.4	Z	32.9	0.2	21.1

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Table B-H16.

Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Destination State: 2017

[Estimates are based on data from the 2017 Commodity Flow Survey]

Destination state	Value		Tons		Ton-miles[1]		Average miles per shipment—coefficient of variation of number
	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	Coefficient of variation of number	Standard error of percent of total	
Total	**3.4**	**0.0**	**4.5**	**0.0**	**4.3**	**0.0**	**11.7**
Alabama	10.8	0.1	10.8	0.1	13.0	0.1	19.4
Alaska	15.1	0.1	17.5	0.1	S	S	16.8
Arizona	20.6	0.1	23.3	0.1	13.3	0.1	22.8
Arkansas	11.0	0.1	8.5	Z	13.4	0.1	S
California	7.8	0.6	7.3	0.4	17.5	0.8	15.2
Colorado	15.0	0.1	16.5	0.1	22.2	0.1	21.7
Connecticut	18.5	0.2	16.5	0.2	40.9	1.1	28.6
Delaware	25.9	0.1	27.1	Z	17.3	Z	43.4
District of Columbia	S	S	31.5	Z	S	S	S
Florida	9.3	0.4	9.8	0.3	21.0	1.3	25.2
Georgia	6.5	0.2	8.0	0.2	17.1	0.5	25.0
Hawaii	16.6	0.1	21.4	0.1	20.0	Z	S
Idaho	12.3	Z	24.6	0.1	20.5	0.1	19.8
Illinois	9.2	0.4	9.2	0.4	14.5	0.5	17.4
Indiana	10.3	0.2	11.2	0.2	15.5	0.3	13.2
Iowa	8.4	Z	13.6	0.1	17.1	0.2	22.2
Kansas	18.7	0.3	23.5	0.4	22.0	0.3	S
Kentucky	10.4	0.1	11.4	0.1	12.4	0.1	11.2
Louisiana	11.4	0.6	13.0	0.7	21.4	1.1	21.3
Maine	8.9	Z	10.2	Z	25.6	0.1	10.8
Maryland	25.5	0.1	25.9	0.1	18.8	0.1	30.4
Massachusetts	19.8	0.2	22.3	0.3	15.6	0.1	32.0
Michigan	11.0	0.2	14.4	0.2	9.5	0.2	14.9
Minnesota	13.4	0.2	13.8	0.2	9.0	0.1	21.5
Mississippi	12.3	0.2	14.9	0.2	15.6	0.2	25.3
Missouri	5.1	0.1	12.8	0.1	18.2	0.1	14.9
Montana	19.7	0.1	24.5	0.1	24.1	0.2	S
Nebraska	18.5	0.1	16.8	0.1	25.9	0.3	30.5
Nevada	19.5	0.1	11.9	Z	15.0	0.1	28.1
New Hampshire	23.3	0.2	20.5	0.1	20.4	0.1	35.3
New Jersey	13.7	0.3	14.2	0.3	10.3	0.4	17.0
New Mexico	21.2	0.1	26.8	0.1	39.4	0.2	23.5
New York	13.0	0.3	14.3	0.3	15.0	0.2	22.9
North Carolina	7.4	0.1	8.4	0.1	10.7	0.2	16.5
North Dakota	10.9	Z	15.7	0.1	13.3	0.1	28.5
Ohio	8.1	0.2	9.9	0.2	29.4	0.9	14.7
Oklahoma	8.6	0.2	9.8	0.2	24.2	0.6	28.1
Oregon	11.6	0.1	16.8	0.1	26.8	0.3	31.0
Pennsylvania	7.7	0.2	8.2	0.2	14.6	0.4	16.8
Rhode Island	21.2	Z	28.0	Z	23.1	Z	30.9
South Carolina	6.4	0.1	7.8	Z	12.9	0.3	25.6
South Dakota	27.5	0.1	33.1	Z	16.2	Z	S
Tennessee	11.0	0.1	11.9	0.1	25.1	0.5	25.9
Texas	5.7	1.0	7.1	1.1	7.6	1.4	23.7
Utah	19.0	0.2	19.9	0.2	S	S	23.7
Vermont	25.6	Z	30.0	Z	24.3	Z	44.1
Virginia	12.3	0.1	11.1	0.1	32.9	0.5	S
Washington	12.4	0.2	13.9	0.3	14.6	0.3	28.2
West Virginia	9.1	0.1	9.3	0.1	9.2	0.1	18.0
Wisconsin	6.8	0.1	6.9	0.1	14.7	0.1	18.3
Wyoming	8.9	Z	14.0	Z	20.6	0.1	24.3

S Withheld because estimate did not meet publication standards.

Z Rounds to zero.

[1] Ton-miles estimates are based on estimated distances traveled along a modeled transportation network. See the "Mileage Calculation" section for additional information.

Note: The "2017 CFS Methodology" section provides information on confidentiality protection, sampling error, nonsampling error, sample design, and definitions.

Appendix A.

Reference List: 2017 CFS Publication Tables to Data.census.gov Tables

Publication table	Publication table title	data.census.gov table
A1a	Shipment Characteristics by Mode of Transportation for the United States: 2017	CF1700A01
A1b	Shipment Characteristics by Mode of Transportation for the United States: 2017 and 2012	CF1700A01
A2a	Shipment Characteristics by Total Modal Activity for the United States: 2017	CF1700A02
A2b	Shipment Characteristics by Total Modal Activity for the United States: 2017 and 2012	CF1700A02
A3a	Shipment Characteristics by Distance Shipped for the United States: 2017	CF1700A06
A3b	Shipment Characteristics by Distance Shipped for the United States: 2017 and 2012	CF1700A06
A4a	Shipment Characteristics by Shipment Weight for the United States: 2017	CF1700A07
A4b	Shipment Characteristics by Shipment Weight for the United States: 2017 and 2012	CF1700A07
A5a	Shipment Characteristics by Two-Digit Commodity for the United States: 2017	CF1700A09
A5b	Shipment Characteristics by Two-Digit Commodity for the United States: 2017 and 2012	CF1700A09
A6	Shipment Characteristics by Three-Digit Commodity for the United States: 2017	CF1700A09
A7a	Shipment Characteristics by NAICS for the United States: 2017	CF1700A08
A7b	Shipment Characteristics by NAICS for the United States: 2017 and 2012	CF1700A08
A8	Shipment Characteristics by Origin State: 2017	CF1700A20
A9	Shipment Characteristics by Destination State: 2017	CF1700A20
T1a	Shipment Characteristics of Temperature Controlled Shipments by Mode of Transportation for the United States: 2017	CF1700TC01
T1b	Shipment Characteristics of Temperature Controlled Shipments by Mode of Transportation for the United States: 2017 and 2012	CF1700TC01
T2a	Shipment Characteristics of Temperature Controlled Shipments by Total Modal Activity for the United States: 2017	CF1700TC02
T2b	Shipment Characteristics of Temperature Controlled Shipments by Total Modal Activity for the United States: 2017 and 2012	CF1700TC02
T3a	Shipment Characteristics of Temperature Controlled Shipments by Distance Shipped for the United States: 2017	CF1700TC03
T3b	Shipment Characteristics of Temperature Controlled Shipments by Distance Shipped for the United States: 2017 and 2012	CF1700TC03
T4a	Shipment Characteristics of Temperature Controlled Shipments by Shipment Weight for the United States: 2017	CF1700TC04
T4b	Shipment Characteristics of Temperature Controlled Shipments by Shipment Weight for the United States: 2017 and 2012	CF1700TC04
T5a	Shipment Characteristics of Temperature Controlled Shipments by Two-Digit Commodity for the United States: 2017	CF1700TC06
T5b	Shipment Characteristics of Temperature Controlled Shipments by Two-Digit Commodity for the United States: 2017 and 2012	CF1700TC06
T6	Shipment Characteristics of Temperature Controlled Shipments by Three-Digit Commodity for the United States: 2017	CF1700TC06
T7a	Shipment Characteristics of Temperature Controlled Shipments by NAICS for the United States: 2017	CF1700TC05
T7b	Shipment Characteristics of Temperature Controlled Shipments by NAICS for the United States: 2017 and 2012	CF1700TC05
T8	Shipment Characteristics of Temperature Controlled Shipments by Origin State: 2017	CF1700TC13
T9	Shipment Characteristics of Temperature Controlled Shipments by Destination State: 2017	CF1700TC14
E1a	Export Shipment Characteristics by Export Mode of Transportation: 2017	CF1700E1
E1b	Export Shipment Characteristics by Export Mode of Transportation: 2017 and 2012	CF1700E1
E2a	Export Shipment Characteristics by Domestic Mode of Transportation: 2017	CF1700E2
E2b	Export Shipment Characteristics by Domestic Mode of Transportation: 2017 and 2012	CF1700E2
E3	Export Shipment Characteristics by Domestic Mode Share: 2017	CF1700E3
E4a	Export Shipment Characteristics by Country of Destination: 2017	CF1700E4
E4b	Export Shipment Characteristics by Country of Destination: 2017 and 2012	CF1700E4
E5a	Export Shipment Characteristics by Export Mode of Transportation and Country of Destination: 2017	CF1700E5

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Reference List: 2017 CFS Publication Tables to Data.census.gov Tables—Con.

Publication table	Publication table title	data.census.gov table
E5b	Export Shipment Characteristics by Export Mode of Transportation and Country of Destination: 2017 and 2012	CF1700E5
E6a	Export Shipment Characteristics by Two-Digit Commodity: 2017	CF1700E6
E6b	Export Shipment Characteristics by Two-Digit Commodity: 2017 and 2012	CF1700E6
E7	Export Shipment Characteristics by NAICS: 2017	CF1700E8
E8	Export Shipment Characteristics by Origin State: 2017	CF1700E7
H1a	Hazardous Material Shipment Characteristics by Mode of Transportation for the United States: 2017	CF1700H01
H1b	Hazardous Material Shipment Characteristics by Mode of Transportation for the United States: 2017 and 2012	CF1700H01
H2a	Hazardous Material Shipment Characteristics by Hazard Class for the United States: 2017	CF1700H02
H2b	Hazardous Material Shipment Characteristics by Hazard Class for the United States: 2017 and 2012	CF1700H02
H3	Hazardous Material Shipment Characteristics by Hazard Division for the United States: 2017	CF1700H02
H4	Hazardous Material Shipment Characteristics for the Selected UN/NA Numbers for the United States: 2017	CF1700H03
H5	Hazardous Versus Nonhazardous Material Shipment Characteristics by Mode of Transportation for the United States: 2017	CF1700H04
H6	Shipment Characteristics by Selected Commodities for Hazardous Materials for the United States: 2017	CF1700H08
H7a	Hazardous Material Shipment Characteristics by Selected Commodities for the United States: 2017	CF1700H09
H7b	Hazardous Material Shipment Characteristics by Selected Commodities for the United States: 2017 and 2012	CF1700H09
H8a	Hazardous Material Shipment Characteristics by Truck for Intrastate Versus Interstate for Selected UN/NA Numbers for the United States: 2017	CF1700H11
H8b	Hazardous Material Shipment Characteristics by Rail for Intrastate Versus Interstate for Selected UN/NA Numbers for the United States: 2017	CF1700H12
H8c	Hazardous Material Shipment Characteristics by Water for Intrastate Versus Interstate for Selected UN/NA Numbers for the United States: 2017	CF1700H12
H8d	Hazardous Material Shipment Characteristics by Pipeline for Intrastate Versus Interstate for Selected UN/NA Numbers for the United States: 2017	CF1700H12
H8e	Hazardous Material Shipment Characteristics by Truck-Rail for Intrastate Versus Interstate for Selected UN/NA Numbers for the United States: 2017	CF1700H12
H9	Hazardous Material Shipment Characteristics for Toxic by Inhalation (TIH) for the United States: 2017	CF1700H13
H10	Hazardous Material Shipment Characteristics for Packing Group I for the United States: 2017	CF1700H14
H11a	Hazardous Material Shipment Characteristics for Export by Country of Destination: 2017	CF1700H15
H11b	Hazardous Material Shipment Characteristics for Export by Country of Destination: 2017 and 2012	CF1700H15
H12	Hazardous Material Shipment Characteristics by Selected NAICS Code and Mode of Transportation for the United States: 2017	CF1700H16
H13	Hazardous Material Shipment Characteristics of Temperature Controlled Shipments by Mode of Transportation for the United States: 2017	CF1700H17
H14	Hazardous Material Shipment Characteristics of Temperature Controlled Shipments by Selected UN/NA Numbers for the United States: 2017	CF1700H18
H15	Hazardous Material Shipment Characteristics by Origin State: 2017	CF1700H05
H16	Hazardous Material Shipment Characteristics by Destination State: 2017	CF1700H06
B-A1a	Estimated Measures of Reliability for Shipment Characteristics by Mode of Transportation for the United States: 2017	CF1700A01
B-A1b	Estimated Measures of Reliability for Shipment Characteristics by Mode of Transportation for the United States: 2017 and 2012	CF1700A01
B-A2a	Estimated Measures of Reliability for Shipment Characteristics by Total Modal Activity for the United States: 2017	CF1700A02
B-A2b	Estimated Measures of Reliability for Shipment Characteristics by Total Modal Activity for the United States: 2017 and 2012	CF1700A02
B-A3a	Estimated Measures of Reliability for Shipment Characteristics by Distance Shipped for the United States: 2017	CF1700A06
B-A3b	Estimated Measures of Reliability for Shipment Characteristics by Distance Shipped for the United States: 2017 and 2012	CF1700A06

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Reference List: 2017 CFS Publication Tables to Data.census.gov Tables—Con.

Publication table	Publication table title	data.census.gov table
B-A4a	Estimated Measures of Reliability for Shipment Characteristics by Shipment Weight for the United States: 2017	CF1700A07
B-A4b	Estimated Measures of Reliability for Shipment Characteristics by Shipment Weight for the United States: 2017 and 2012	CF1700A07
B-A5a	Estimated Measures of Reliability for Shipment Characteristics by Two-Digit Commodity for the United States: 2017	CF1700A09
B-A5b	Estimated Measures of Reliability for Shipment Characteristics by Two-Digit Commodity for the United States: 2017 and 2012	CF1700A09
B-A6	Estimated Measures of Reliability for Shipment Characteristics by Three-Digit Commodity for the United States: 2017	CF1700A09
B-A7a	Estimated Coefficients of Variation for Shipment Characteristics by NAICS for the United States: 2017	CF1700A08
B-A7b	Estimated Measures of Reliability for Shipment Characteristics by NAICS for the United States: 2017 and 2012	CF1700A08
B-A8	Estimated Coefficients of Variation for Shipment Characteristics by Origin State: 2017	CF1700A20
B-A9	Estimated Coefficients of Variation for Shipment Characteristics by Destination State: 2017	CF1700A20
B-T1a	Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled Shipments by Mode of Transportation for the United States: 2017	CF1700TC01
B-T1b	Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled Shipments by Mode of Transportation for the United States: 2017 and 2012	CF1700TC01
B-T2a	Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled Shipments by Total Modal Activity for the United States: 2017	CF1700TC02
B-T2b	Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled Shipments by Total Modal Activity for the United States: 2017 and 2012	CF1700TC02
B-T3a	Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled Shipments by Distance Shipped for the United States: 2017	CF1700TC03
B-T3b	Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled Shipments by Distance Shipped for the United States: 2017 and 2012	CF1700TC03
B-T4a	Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled Shipments by Shipment Weight for the United States: 2017	CF1700TC04
B-T4b	Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled Shipments by Shipment Weight for the United States: 2017 and 2012	CF1700TC04
B-T5a	Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled Shipments by Two-Digit Commodity for the United States: 2017	CF1700TC06
B-T5b	Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled Shipments by Two-Digit Commodity for the United States: 2017 and 2012	CF1700TC06
B-T6	Estimated Measures of Reliability for Shipment Characteristics of Temperature Controlled Shipments by Three-Digit Commodity for the United States: 2017	CF1700TC06
B-T7a	Estimated Coefficients of Variation for Shipment Characteristics of Temperature Controlled Shipments by NAICS for the United States: 2017	CF1700TC05
B-T7b	Estimated Coefficients of Variation for Shipment Characteristics of Temperature Controlled Shipments by NAICS for the United States: 2017 and 2012	CF1700TC05
B-T8	Estimated Coefficients of Variation for Shipment Characteristics of Temperature Controlled Shipments by Origin State: 2017	CF1700TC13
B-T9	Estimated Coefficients of Variation for Shipment Characteristics of Temperature Controlled Shipments by Destination State: 2017	CF1700TC14
B-E1a	Estimated Measures of Reliability for Export Shipment Characteristics by Export Mode of Transportation: 2017	CF1700E1
B-E1b	Estimated Measures of Reliability for Export Shipment Characteristics by Export Mode of Transportation: 2017 and 2012	CF1700E1
B-E2a	Estimated Measures of Reliability for Export Shipment Characteristics by Domestic Mode of Transportation: 2017	CF1700E2
B-E2b	Estimated Measures of Reliability for Export Shipment Characteristics by Domestic Mode of Transportation: 2017 and 2012	CF1700E2
B-E3	Estimated Measures of Reliability for Export Shipment Characterisitcs by Domestic Mode Share: 2017	CF1700E3
B-E4a	Estimated Measures of Reliability for Export Shipment Characteristics by Country of Destination: 2017	CF1700E4
B-E4b	Estimated Measures of Reliability for Export Shipment Characteristics by Country of Destination: 2017 and 2012	CF1700E4

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Publication table	Publication table title	data.census.gov table
B-E5a	Estimated Measures of Reliability for Export Shipment Characteristics by Export Mode of Transportation and Country of Destination: 2017	CF1700E5
B-E5b	Estimated Measures of Reliability for Export Shipment Characteristics by Export Mode of Transportation and Country of Destination: 2017 and 2012	CF1700E5
B-E6a	Estimated Measures of Reliability for Export Shipment Characteristics by Two-Digit Commodity: 2017	CF1700E6
B-E6b	Estimated Measures of Reliability for Export Shipment Characteristics by Two-Digit Commodity: 2017 and 2012	CF1700E6
B-E7	Estimated Measures of Reliability for Export Shipment Characteristics by NAICS: 2017	CF1700E8
B-E8	Estimated Measures of Reliability for Export Shipment Characteristics by Origin State: 2017	CF1700E7
B-H1a	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Mode of Transportation for the United States: 2017	CF1700H01
B-H1b	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Mode of Transportation for the United States: 2017 and 2012	CF1700H01
B-H2a	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Hazard Class for the United States: 2017	CF1700H02
B-H2b	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Hazard Class for the United States: 2017 and 2012	CF1700H02
B-H3	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Hazard Division for the United States: 2017	CF1700H02
B-H4	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics for the Selected UN/NA Numbers for the United States: 2017	CF1700H03
B-H5	Estimated Measures of Reliability for Hazardous Versus Nonhazardous Material Shipment Characteristics by Mode of Transportation for the United States: 2017	CF1700H04
B-H6	Estimated Measures of Reliability for Shipment Characteristics by Selected Commodities for Hazardous Materials for the United States: 2017	CF1700H08
B-H7a	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Selected Commodities for the United States: 2017	CF1700H09
B-H7b	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Selected Commodities for the United States: 2017 and 2012	CF1700H09
B-H8a	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Truck for Intrastate Versus Interstate for Selected UN/NA Numbers for the United States: 2017	CF1700H11
B-H8b	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Rail for Intrastate Versus Interstate for Selected UN/NA Numbers for the United States: 2017	CF1700H12
B-H8c	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Water for Intrastate Versus Interstate for Selected UN/NA Numbers for the United States: 2017	CF1700H12
B-H8d	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Pipeline for Intrastate Versus Interstate for Selected UN/NA Numbers for the United States: 2017	CF1700H12
B-H8e	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Truck-Rail for Intrastate Versus Interstate for Selected UN/NA Numbers for the United States: 2017	CF1700H12
B-H9	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics for Toxic by Inhalation (TIH) for the United States: 2017	CF1700H13
B-H10	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics for Packaging Group I for the United States: 2017	CF1700H14
B-H11a	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics for Export by Country of Destination: 2017	CF1700H15
B-H11b	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics for Export by Country of Destination: 2017 and 2012	CF1700H15
B-H12	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Selected NAICS Code and Mode of Transportation for the United States: 2017	CF1700H16
B-H13	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics of Temperature Controlled Shipments by Mode of Transportation for the United States: 2017	CF1700H17
B-H14	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics of Temperature Controlled Shipments by Selected UN/NA Numbers for the United States: 2017	CF1700H18
B-H15	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Origin State: 2017	CF1700H05
B-H16	Estimated Measures of Reliability for Hazardous Material Shipment Characteristics by Destination State: 2017	CF1700H06