2022 Commodity Flow Survey Methodology

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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; refer to the **Geographic Strata** section for a definition of CFS Areas) data on domestic freight shipments by establishments located in the 50 states and the District of Columbia and is classified in Mining, Manufacturing, Wholesale, and selected retail and services trade industries as defined by the 2017 North American Industry Classification System (NAICS). Auxiliary establishments, such as warehouses and central administrative offices with shipping activity that support the operations of large multiestablishment companies, are also included.

Data are provided on the type of commodity, origin, destination, value, weight, mode of transportation, and distance of shipments. 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 has been conducted in 1993, 1997, 2002, 2007, 2012, 2017, and 2022.

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, safety risk, and environmental concerns. Additionally, business owners, 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 2022 CFS is to estimate shipping volumes (value and weight) by commodity and mode of transportation at various levels of geographic detail. Another objective is to estimate shipping volumes moving from one geographic area to another (i.e., flows of commodities between states or regions) by mode and commodity. A detailed description of the survey coverage is provided in the **Industry Coverage** and **Shipment Coverage** sections, and the **Sample Design Overview** section explains the 2022 CFS sample design.

INDUSTRY COVERAGE

The 2022 CFS covers business establishments with paid employees that were located in the United States and were classified using the 2017 NAICS in Mining (except Oil and Gas), Manufacturing, Wholesale Trade, selected industries from Retail Trade and services, and publishers. Additionally, the survey covered auxiliary establishments, i.e. Warehousing and Storage (NAICS 4931) and Corporate, Subsidiary, and Regional Managing Offices (NAICS 551114) of multiestablishment companies.

CFS Industries

In-scope industries for the 2022 CFS were selected based on the 2017 NAICS definitions. 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); there have been some changes in industry coverage due to the conversion from SIC to NAICS (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]). 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 NAICS industries covered in the 2022 CFS (based on the 2017 NAICS definitions) are listed in Table 1.

Excluded industries: Establishments classified in transportation (other than freight trucking and warehousing), construction, and most retail and services industries were excluded. These industries have several million establishments in total. Including these industries in the survey would have either: (1) reduced the quality of the data, since large numbers of establishments would have been nonshippers, or (2) required a much greater sample size (and much greater cost). Other industries that were not covered, but may have significant shipping activity, include agriculture and government. These were out-of-scope to the Economic Census (except NAICS 1151 and 1152, Support Activities for Crop Production and for Animal Production, which do not have shipping activity) and the Census Bureau had no data on the shipping activity of individual establishments in these industries. For agriculture, while the CFS did not cover shipments of agricultural products from the farm site to the processing centers or terminal elevators (generally short-distance local movements), it did cover the shipments of these products from the initial processing centers or terminal elevators onward.

Table 1.

NAICS Industries In-Scope to the 2022 Commodity Flow Survey

NAICS code	Description	Approximate number of establishments in frame	Approximate number of establishments in sample
212	Mining (Except Oil and Gas)	5,800	2,800
311	Food Manufacturing	29,000	3,300
312	Beverage and Tobacco Product Manufacturing	12,000	2,800
313	Textile Mills	1,900	950
314	Textile Product Mills	5,900	1,700
315	Apparel Manufacturing	5,500	1,300
316	Leather and Allied Product Manufacturing	1,200	700
321	Wood Product Manufacturing	14,000	2,600
322	Paper Manufacturing	3,800	1,600
323	Printing and Related Support Activities	23,500	2,800
324	Petroleum and Coal Products Manufacturing	2,100	1,500
325	Chemical Manufacturing	14,000	8,300
326	Plastics and Rubber Products Manufacturing	11,500	2,600
327	Nonmetallic Mineral Product Manufacturing	15,000	2,800
331	Primary Metal Manufacturing	4,000	1,500
332	Fabricated Metal Product Manufacturing	53,500	4,200
333	Machinery Manufacturing	22,000	2,900
334	Computer and Electronic Product Manufacturing	11,500	2,200
335	Electrical Equipment, Appliance, and Component Manufacturing	5,300	1,800
336	Transportation Equipment Manufacturing	11,500	2,300
337	Furniture and Related Product Manufacturing	14,500	2,300
339	Miscellaneous Manufacturing	24,500	2,600
4231[1]	Motor Vehicle and Parts Merchant Wholesalers	21,500	2,900
4232[1]	Furniture and Home Furnishing Merchant Wholesalers	11,000	2,100
4233[1]	Lumber and Other Construction Materials Merchant Wholesalers	17,000	3,000
4234[1]	Commercial Equip. Merchant Wholesalers	26,000	4,800
4235[1]	Metal and Mineral (except Petroleum) Merchant Wholesalers	8,900	2,200
4236[1]	Electrical and Electronic Goods Merchant Wholesalers	24,500	2,900
4237[1]	Hardware and Plumbing Merchant Wholesalers	18,500	2,900
4238[1]	Machinery, Equipment, and Supplies Merchant Wholesalers	52,500	4,200
4239[1]	Miscellaneous Durable Goods Merchant Wholesalers	29,500	7,700
4241[1]	Paper and Paper Product Merchant Wholesalers	7,900	1,900
4242[1]	Drugs and Druggists' Sundries Merchant Wholesalers	8,700	1,400
4243[1]	Apparel, Piece Goods, and Notions Merchant Wholesalers	13,000	1,700
4244[1]	Grocery and Related Product Merchant Wholesalers	31,500	3,100
4245[1]	Farm Product Raw Material Merchant Wholesalers	6,100	1,600
4246[1]	Chemical and Allied Products Merchant Wholesalers	11,000	9,600
4247[1]	Petroleum and Petroleum Products Merchant Wholesalers	5,700	2,300
4248[1]	Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers	4,400	1,600
4249[1]	Miscellaneous Nondurable Goods Merchant Wholesalers	26,500	4,600
4541[2]	Electronic Shopping and Mail-Order Houses	51,500	10,000
4543[1]	Fuel Dealers	7,700	2,000
4841[2, 3]	General Freight Trucking	[4]6,500	[4]6,500
4842[2, 3]	Specialized Freight Trucking	[4]6,500	[4]6,500
4931[2, 3]	Warehousing and Storage	[4]6,500	[4]6,500
5111[2]	Newspaper, Periodical, Book, and Directory Publishers	[5]12,000	[5]12,000
51223[2]	Music Publishers	[5]12,000	[5]12,000
551114[2]	Corporate, Subsidiary, and Regional Managing Offices	18,000	18,000
	Totals[6]	**712,000**	**165,000**

[1] Wholesale establishments exclude manufacturer's sales offices and own brand importers.

[2] If the 2017 Advance Survey or the 2017 Commodity Flow Survey indicated that the establishment did not have shipping activity, then the establishment was removed from the frame.

[3] Includes only auxiliary 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.

[4] Number of establishments in NAICS 4841, 4842, and 4931 combined.

[5] Number of establishments in NAICS 5111 and 51223 combined.

[6] Due to rounding, details will not exactly sum to the total.

Note: NAICS is the North American Industry Classification System. The Census Bureau has reviewed this table to ensure appropriate access, use, and disclosure avoidance protection of the confidential source data (Project No. 7504609, Disclosure Review Board (DRB) approval number: CBDRB-FY25-ESMD002-015).

Source: U.S. Census Bureau, 2025.

General exclusions: Most government or military operated establishments were excluded from the CFS. The exception is government liquor wholesalers. The CFS also excluded establishments or firms with no paid employees.

SHIPMENT COVERAGE

The CFS collected data on shipments originating from selected business establishments located in the 50 states and the District of Columbia. The CFS did not collect data on 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) were not included, nor were shipments from a foreign location to an initial U.S. location. However, imported products were included in the CFS from the point that they leave the importer's initial U.S. location (assuming it was in an industry in-scope to the CFS) for shipment to another location. Shipments that were shipped through a foreign territory with both the origin and destination in the United States were included in the CFS data. Export shipments were included, with the domestic destination defined as the U.S. port, airport, or border crossing of exit from the United States. Refer to the **Mileage Calculation** section for additional detail on how mileage estimates were developed.

SAMPLE DESIGN OVERVIEW

The sample for the 2022 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

The first stage sample design was stratified, simple random sampling without replacement.

To create the first-stage sampling frame, a subset of establishment records (as of October 2021) was extracted from the Census Bureau's Business Register. The Business Register is a database of all known establishments located in the United States or 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 2019 or 2020, (or 2021, for single-establishment companies), and classified in Mining (except Oil and Gas Extraction), Manufacturing, Wholesale Trade, Electronic Shopping and Mail Order, Fuel Dealers, and publishing industries (as defined by the 2017 NAICS) were included on the sampling frame. Certain wholesalers (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 (i.e., Truck Transportation, Warehousing and Storage, and Corporate, Subsidiary, and Regional Managing Offices) 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 were referred to as nonauxiliary establishments.

As described previously in the **CFS Industries** section, establishments classified in Agriculture, Forestry, Fishing and Hunting, 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 2022, the resulting frame contained approximately 712,000 establishments as summarized in Table 2.

Table 2.
Commodity Flow Survey (CFS) Frame/Number of Establishments in Industry Categories

Trade area	Establishments on the CFS frame			
	2022 CFS	2017 CFS	2012 CFS	2007 CFS
Mining	5,800	6,100	6,500	6,800
Manufacturing	286,000	288,000	306,000	328,000
Wholesale	324,000	340,000	346,000	356,000
Retail	59,500	40,500	27,500	25,000
Services	12,000	12,000	15,500	22,500
Auxiliaries	24,500	24,000	15,000	15,000
Total[1]	**712,000**	**710,000**	**716,000**	**754,000**

[1] Due to rounding, details will not exactly sum to the total.
Note: The Census Bureau has reviewed this table to ensure appropriate access, use, and disclosure avoidance protection of the confidential source data (Project No. 7504609, Disclosure Review Board (DRB) approval number: CBDRB-FY25-ESMD002-015).
Source: U.S. Census Bureau, 2025.

Sales, payroll, a 6-digit NAICS code, name and address, and a primary identifier were extracted for each establishment, and a measure of size was computed. The measure of size was designed to approximate an establishment's annual total value of shipments for the year 2019 or 2020. One reason we say approximate is because often we compute the measure of size as the sales from the 2017 Economic Census multiplied by the ratio of the 2019 (or 2020) payroll to the 2017 payroll.

Stratification

The sampling frame was stratified by geography and by industry, then further substratified by measure-of-size (MOS) class—with some exceptions for auxiliary establishments and hazardous materials establishments, as described in the **Auxiliary Strata** and **HAZMAT Strata** sections.[1] The geography by industry cells form the primary strata for the main part of the sample.

Geographic Strata

All of the establishments included on the sampling frame had state and county geographic codes. We used these codes to assign each establishment to geographic strata. Geographic strata were defined using the March 2020 Office of Management and Budget's (OMB Bulletin 20-01) definitions of metropolitan statistical areas (MSAs) and combined statistical areas (CSAs). CSAs and MSAs were further broken into single-state components, and some were selected based on their population and importance as transportation hubs or foreign trade gateways to be CFS Areas, the CFS geographic strata. Any county not in a selected single-state component of MSAs/CSAs was assigned to either a remainder-of-state CFS Area or a whole state CFS Area.

For example, the Chicago CSA contained counties in three states: Illinois, Indiana, and Wisconsin. Two of those state parts were large enough, so the Illinois and Indiana parts of the Chicago CSA were selected as CFS Areas. The Wisconsin part was considered too small to be a separate CFS Area and was instead assigned to the Remainder of Wisconsin CFS Area.

Note that the MSA and CSA definitions have been updated more recently in OMB Bulletin 23-01, and among many changes, MSAs and CSAs in Connecticut are now defined in terms of planning regions instead of counties. Bulletin 23-01 came after the CFS sample selection and data collection. CFS Areas remained in terms of the OMB Bulletin 20-01 definitions with one exception: we added Warren County, New Jersey, to the CFS Area representing the New Jersey part of the New York CSA, even though it was not included in the definition of the New York CSA. This prevented the necessity for a one-county Remainder of New Jersey CFS Area, which would be considerably smaller than other CFS Areas.

Table 3 provides the number of CFS Areas used as sampling strata, by type of CFS Area.

[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).

Table 3.
Summary of 2022 Commodity Flow Survey (CFS) Geographic Stratification

Type of geographic stratum (CFS area)	Number of geographic strata (CFS areas)
Metropolitan area (CSA or MSA) state part	86
Remainder of the state (ROS)[1]	36
Whole state (AK, AR, ID, ME, MS, MT, NM, ND, SD, VT, WV, WY)	12
Total number of CFS Areas	**134**

[1] Three states do not have a Remainder of State (ROS) component. These are the District of Columbia, New Jersey, and Rhode Island.
Source: U.S. Census Bureau, 2025.

Refer to the **Map of 2022 CFS Areas** at the end of the report for the CFS areas and the frame and sample counts for each.

Industry Strata

The industry strata were defined as follows. Within each CFS Area, we defined 47 industry categories based on the 2017 NAICS codes:

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

Auxiliary Strata

We defined auxiliary establishments as establishments whose NAICS code begins with 484 (Truck Transportation) or 4931 (Warehousing and Storage), or whose NAICS code is 551114 (Corporate, Subsidiary, and Regional Managing Offices). In addition, an auxiliary establishment must only provide support to a multiunit company with whom it is associated. As part of the decision to not conduct an advance survey before the 2022 CFS, it was decided to select all auxiliary establishments with certainty.

For the purposes of assigning primary stratum codes to establishments, auxiliary establishments are assigned to one of two industry strata: NAICS 4931 (which includes NAICS 484) or NAICS 551114, and the primary stratum is a combination of industry stratum and CFS area. All these primary strata are selected with certainty.

HAZMAT Strata

In order to produce good estimates of quantities corresponding to shipments of hazardous materials (HAZMAT), 35 6-digit NAICS industries with large amounts of HAZMAT shipments were identified and used to form primary strata. The 2017 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 large percentage of their (unweighted) shipments were HAZMAT shipments.

The 35 HAZMAT industries were removed from the main or auxiliary strata they would otherwise have been assigned to and were defined as certainty strata.[2] For example, one of the HAZMAT industries was NAICS 423490 (Other Professional Equipment and Supplies Merchant Wholesalers). Because of this, the main stratum for NAICS 4234 represented all the industries in NAICS 4234 other than 423490.

Table 4 provides the number of primary strata (not counting strata that do not contain any establishments) and the number of establishments in the sample for the main, auxiliary, and HAZMAT parts of the sample, plus two special certainty strata. Note that for the main part of the sample, the table provides the number of strata before they are further stratified by the MOS.

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

Substratifying by MOS Size Class, Determining the Sample Sizes, and Selecting the Sample

The total desired sample size for the first stage sample was approximately 165,000 establishments and was fixed due to budget constraints. Therefore, in addition to defining the primary strata, a sample size was determined for each primary stratum. This was performed as follows:

A target coefficient of variation (CV) for the estimate of total MOS (which was data on the frame that was positively correlated with shipment value) was assigned to each main primary stratum (geography by industry cell). This was a design-based CV, based on establishment-level data. CFS estimates were made with shipment-level data, and smaller targets should lead to smaller CVs for estimates made with shipment-level data in the same geography and industry.

Target CVs were assigned using a baseline target CV modified by a few multiplicative "factors." The baseline target CVs for a geography by industry cell (i.e., main primary strata) ranged from between 0.9 percent and 2.0 percent and were determined based on the total MOS in the CFS Area of the corresponding cell; CFS Areas with larger MOS had cells with smaller target CVs. There were two primary multiplicative factors for cell target CVs based on industry. The first was based on the total MOS of the industry within the CFS Area of the cell and ranged between 0.8 and 1.2, with higher totals getting smaller factors. The second was determined by the NAICS itself. Any cell with NAICS 5111 received a factor of zero, making all the associated main primary strata certainties. NAICS 4541 received a factor of 0.31, and the remaining NAICS had factors between 0.9 and 1.1. Other factors modified CV targets for a relatively small set of main primary strata.

Table 4.
2022 Commodity Flow Survey (CFS) Primary Stratification Summary

Sample component	Primary strata	Number of primary strata	Approximate number of establishments in the sample
Main	NAICS x CFS Area	5,801	113,000
Auxiliary	NAICS 484 and 4931 x CFS Area	134	6,500
	NAICS 551114 x CFS Area	134	18,000
HAZMAT	6-digit NAICS	35	26,000
Special certainty strata	Air or water shipper in prior CFS	1	1,200
	Establishment specifically identified by analysts to be included in the sample	1	20
	Totals[1]	**6,106**	**165,000**

[1] Due to rounding, establishment details will not exactly sum to the total.

Note: NAICS is the North American Industry Classification System. The Census Bureau has reviewed this table to ensure appropriate access, use, and disclosure avoidance protection of the confidential source data (Project No. 7504609, Disclosure Review Board (DRB) approval number: CBDRB-FY25-ESMD002-015).

Source: U.S. Census Bureau, 2025.

Within each main primary stratum, substrata defined by MOS size class were determined that minimize the sample size needed to achieve the target CV. The MOS size class substratum boundaries were determined using the Lavallée Hidiroglou (LH) algorithm (Pierre Lavallée and M. A. Hidiroglou, "On the Stratification of Skewed Populations," Survey Methodology, 1988, Vol. 14, No. 1, pp. 33–43). The LH algorithm is a method of finding optimum stratum boundaries, for a given number of strata, for a specified CV. We calculated boundaries for 2, 3, 5, 7, 9, 11, and 13 MOS substrata. The number of MOS substrata that we used is the one that minimized the sample size needed to achieve the target CV for each main primary stratum. The method of determining sample sizes in the MOS substrata was the Neyman allocation ($n_h \propto N_h S_h$). Each primary stratum has a certainty substratum for the establishments with the largest MOS.

Once the minimum sample sizes for each primary stratum were determined, these were added together and compared to the desired target sample size of approximately 165,000. If the total sample size was not close enough to 165,000, we multiplied all of the target CVs by a fixed factor and repeated the process, until the total sample size was approximately 165,000.

The establishments in the geography by industry by MOS size class substrata were selected by simple random sampling without replacement.

Second Stage—Reporting Week Selection

The second stage sample design is a systematic sample of panels, where a panel is defined as a set of 4 weeks, 1 week from each quarter. Panel 1 is the first week of each quarter, panel 2 is the second week of each quarter, panel 3 is the third week of each quarter, and so on for a total of 13 panels.

The entire first stage sample of establishments, i.e. the main, auxiliary, HAZMAT, and special certainty samples combined, was sorted by:

- State.
- CFS Area, HAZMAT status, or certainty status.
- Industry stratum.
- MOS.

More specifically, state was ordered by Federal Information Processing Series (FIPS) code; CFS Area was a five-digit code representing the MSA or CSA (three-digit CSAs appear with two leading zeroes), HAZMAT status appears as 'HCERT', certainty status appears as "CERT1" or "CERT2" depending on the special certainty stratum; and industry stratum was either a four-digit NAICS code, "HAxx" for HAZMAT strata ("xx" is a two-digit number that labels the stratum), or "CRT1" or "CRT2" (corresponding to CERT1 or CERT2 above) for the certainty strata.

Because of the nature of the coding for CFS Area/HAZMAT status/certainty status, establishments in the main and auxiliary strata appeared first in the sort order (within a state), since they will have a CFS Area, then establishments in the special certainty strata appeared next, then establishments in the HAZMAT strata appeared last.

After the establishments were sorted, panel 1 was assigned to the first establishment in the list, panel 2 to the second, and so on until panel 13 was reached. Then, the next establishment was assigned to panel 1 and the process repeated itself.

Third Stage—Shipment Selection

The third-stage sample design was unique because the respondents themselves select the sample. The third-stage sample design was a systematic sample of shipments from all the establishment's shipments in the week, done independently for each of the 4 weeks selected in the second stage sample. In 2022 CFS, for the first time, third-stage sampling was optional. Respondents had the choice to provide all their shipments for a given week if that was preferable to sampling them.

If the respondent chose to sample, then the sample was selected by the respondent from a list of all the establishment's shipments in the week. There were no instructions to sort the list in any particular way. If there were 40 or fewer shipments, then all the shipments were selected. If there were more than 40 shipments, then the respondent was given a "take-every" number, which depended on the number of shipments in the week.

The maximum number of shipments a respondent had to report for in a week is dependent on their industry. The maximum remained at 80 shipments for most industries, but was increased to 100 for NAICS 315, 316, and 4541, and decreased to 60 for NAICS 4248 and 45431.

For NAICS 4248 and 45431, where the maximum weekly sample size was 60 shipments in a reporting week, Table 5 provides the take-every number and third-stage sample sizes for different numbers of weekly shipments.

Note that the third-stage sample size reached 60 many times and dropped back below it. Once the take-every number reached 61, the third-stage sample size was guaranteed to always be 60. That means, once the sample size hits 60 while T equals 60, the sample size would never drop below 60 for any larger shipment count. That value turned out to be 3,600 shipments.

For the majority of NAICS, where the maximum sample size was 80 shipments in a reporting week, Table 6 gives the take-every number and third-stage sample sizes for different numbers of weekly shipments.

Here, once the take-every number reached 81, the third-stage sample size would always be 80. This means that the sample size would not drop below 80 for any shipment count at or above 6,400.

For NAICS 315, 316, and 4541, where the maximum weekly sample size was 100 shipments, Table 7 gives take-every numbers and third-stage sample sizes for different numbers of weekly shipments.

Here, the minimum shipment count for the third-stage sample size to never drop below 100 was 10,000.

DATA COLLECTION

Each establishment selected into the CFS sample was mailed a letter at the end of the first quarter of 2022. We provided instructions to log in and report through the electronic instrument. At the end of each subsequent quarter in 2022, nonrespondents were sent another letter, and respondents were given instructions by email. 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 (dollars).
- Shipment weight (pounds).
- Commodity description.
- An indication (Yes or No) of whether the shipment was temperature controlled.
- United Nations or North American (UN/NA) number for hazardous material shipments.
- U.S. destination (city, state, and ZIP Code)—or port of exit (POE) for export shipment.
- Domestic mode(s) of transport.

Table 5.
NAICS 4248 and 45431, Maximum Sample Size Equals 60

Number of weekly shipments	Take-every number (T)	Third-stage sample size
1–40	1	1–40
41–81	2	20–40
82–121	2	41–60
122–182	3	40–60
183–243	4	45–60
244–304	5	48–60
[…]	[…]	[…]
549–609	10	54–60
61(T-1) through 61T-1	**T > 2**	**⌊(61(1-1/T)⌋ through 60** (The half-brackets indicate the floor function.)

Note: NAICS is the North American Industry Classification System.
Source: U.S. Census Bureau, 2025.

Table 6.
Maximum Sample Size Equals 80 (Most Industries)

Number of weekly shipments	Take-every number (T)	Third-stage sample size
1–40	1	1–40
41–81	2	20–40
82–161	2	41–80
162–242	3	54–80
243–323	4	60–80
324–404	5	64–80
[…]	[…]	[…]
729–809	10	72–80
81(T-1) through 81T-1	**T > 2**	**⌊81(1-1/T)⌋ through 80** (The half-brackets indicate the floor function.)

Note: NAICS is the North American Industry Classification System.
Source: U.S. Census Bureau, 2025.

Table 7.
NAICS 315, 316, and 4541, Maximum Sample Size = 100

Number of weekly shipments	Take-every number (T)	Third-stage sample size
1–40	1	1–40
41–81	2	20–40
82–100	2	41–50
101–201	2	50–100
202–302	3	67–100
303–403	4	75–100
404–504	5	80–100
[…]	[…]	[…]
909–1,009	10	90–100
101(T-1) through 81T-1	**T > 2**	**⌊101(1-1/T)⌋ through 100** (The half-brackets indicate the floor function.)

Note: NAICS is the North American Industry Classification System.
Source: U.S. Census Bureau, 2025.

- City, country, and postal code of destination for exports.
- Export mode of transport.

By CFS definition, a shipment was a single movement of commodities 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 commodities 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 did not include shipments of refuse, scrap paper, waste, or recyclable materials unless the establishment was in the business of selling or providing these materials.

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 Code Changes

There were no changes or additions to the definitions of commodities from 2017 to 2022.

Mileage Calculation Changes

In the 2017 CFS, we calculated the distance traveled using GeoMiler, a custom-built mileage routing and mode imputation tool. However, for the 2022 CFS, after soliciting input from the CFS data user community, we decided to simplify shipment mileage estimation by using GCD (great circle distance). GCD uses Vincenty's formulae, which are commonly used for measuring distances on the earth and are known for higher accuracy (especially for long distances).

EDITS

The reported data are run through a series of establishment and shipment level edits that looked for inconsistences among the data items. During the review of the inconsistencies identified, individual analysts may change specific shipment-level or establishment-level data items, or quarterly edit data items. These are detailed below:

There were 10 establishment-level edits that were applied to establishments (and not to specific shipments). These included but were not limited to edits on shipping/mailing address, contact information, comparing MOS to the annual total value, annual total value, operating status, and the total number of shipments.

There were 17 shipment-level edits that were applied to specific shipments, but also used data, such as the NAICS code, that was at the establishment level. These included but were not limited to edits on domestic destination, mode of transportation, Standard Classification Transportable Goods (SCTG), shipment value, shipment weight, HAZMAT, temperature control, export mode, and export destination. Some of these edits were applied singularly, while others were applied in combination (e.g., the seventh shipment edit was a shipment weight by mode edit that was centered on maximum and minimum weight bounds for certain modes).

There were 13 quarterly edits that were run each quarter. These edits were generally concerned with quarter-to-quarter changes that appeared to be out of the ordinary (e.g., large changes in annual total value, weekly values, or compositions of mode or SCTG).

CORRECTIONS

Analysts used the batch correction tool to update one or multiple variables at the same time across establishments. When a widespread issue within the data needed to be corrected, this tool allowed analysts to update all applicable shipments at the same time. There are five general types of batch corrections used to clean 2022 data. The following are examples of each type.

Commodity code (SCTG) corrections—During data collection, respondents sometimes assigned a commodity code to shipments with a product description that was in fact aligned with a different commodity code. These shipments were corrected to the most accurate commodity code for the product shipped.

Geographic corrections—Examples of geographic corrections included restored leading zeros that were dropped for ZIP Codes in New England and New Jersey, fixed state abbreviations when respondents supplied the complete state name instead of the postal abbreviation (e.g., TE → TX), corrected POE information for shipments to military and diplomatic locations abroad, moved export destination information from the domestic destination fields to the proper export destination fields, corrected export country name when respondent provided city/state or city/province export destination information (e.g., Monterrey, NL → Mexico; Toronto, ON → Canada), and corrected export country name when respondent provided a city and an abbreviated country name (e.g., Phillipsburg, SX → Sint Maarten).

Port of exit (POE) corrections—Most respondents did not provide domestic port of exit information for export shipments. To determine the likely POE for export shipments, we linked CFS export shipments to 2022 international trade data on several factors: state of origin, destination country, mode of transportation, commodity shipped, value, weight, and company. Shipments were matched on any combination of those factors, some only matching on one factor and others on all. Once a match was found, we used the international trade data to determine the POE for the shipment. After export shipments in the CFS data were linked to exports in the 2022 international trade data, we loaded the resulting domestic city, state and ZIP Code (i.e., POE) information from the international trade data into the CFS database via batch correction. Because of the nature of the data and time constraints, we did not use the batch correction tool, but instead loaded the POE data directly into the CFS database via spreadsheet.

Temperature control (TC) corrections—During data collection, respondents at times identified a shipment with a particular commodity code (SCTG) but then assigned that same shipment a temperature control code that conflicted with guidance on commodities needing temperature control. These shipments were corrected so that the temperature control indication aligned with guidance that resulted from a collaboration between the Bureau of Transportation Statistics and the Census Bureau and was based on commodity descriptions/commodity codes. Additionally, some commodity codes were broad enough to cover commodities that would logically need temperature control (e.g., ice) as well as commodities that did not. In this case, analysts corrected the temperature control code for those shipments that would need temperature control within the SCTG.

Domestic mode corrections—Some respondents did not follow the guidelines provided in the shipments spreadsheets on how to code the mode of transportation and instead entered in words that did not align with our coding structure. This resulted in shipments that had viable modes that were unusable for tabulation until the mode was fixed. For example, we corrected domestic modes of transportation when the respondent wrote in "company truck" instead of providing the code "2" and when they wrote "USPS" instead of the code "1."

IMPUTATION

SCTG (Standard Classification of Transported Goods) Code Imputation

We did not ask the respondents to report the SCTG codes; we asked them to provide a description in words of the commodity. SCTG codes were imputed in four phases:

1. During data collection, we used a machine learning (ML) model to attempt to assign SCTG codes in real-time as respondents uploaded their shipment data. If the model's reported probability was below a threshold determined by empirical verification (0.4), we asked respondents to validate a sample of the shipment records they had given us and to provide an SCTG code. This model was limited by disclosure avoidance constraints, as well as performance requirements to provide real-time feedback.

2. After data collection, we used a more robust ML model that incorporated the respondent-validated SCTG codes provided in step 1, to assign codes to as many records as possible based on the description the respondents provided. We developed a model using 6.2 million records from the 2017 CFS, as well as the respondent-validated records from the 2022 CFS (as described in step 1). The model output 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. For a given shipment record, if the model's reported probability was above a certain threshold (0.4), we assigned the full 5-digit SCTG code output by the model to that record.

3. If the model's reported probability was below 0.4, but the model could confidently assign an SCTG code at the 2-digit level, we used a hot-deck imputation method to assign full 5-digit SCTGs from donors with the same 2-digit SCTG. 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 imputation cell level, then the imputation cells were expanded to include more—but slightly less similar—donors. The definition of the imputation cells for Phase 3 is presented in Table 8.

   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 imputation cells continued until a donor was found for each recipient. In some cases, the recipient's UN/NA code and temperature-controlled code were also replaced with the donor code to ensure that the SCTG, UN/NA code, and temperature-controlled code assigned to the recipient were all consistent.

4. For shipments for which we were not able to assign a 2-digit SCTG code with confidence by the machine learning process, (i.e., where the predicted probability

of the 2-digit code was less than or equal to 0.4), an SCTG was imputed using a similar process, with the full 5-digit SCTG being obtained from the donor. The definition of the imputation cells for Phase 4 is presented in Table 9.

Supplemental Table S1 gives the number of shipments imputed by the Phase 3 and 4 hot-deck procedures.

Shipment Value or Shipment Weight Imputation

If the ratio of a shipment's value to weight was unacceptable (falls outside of a commodity-specific range), or if one of these data items was missing, then one of the data items (or the missing value) was replaced by a predicted value obtained from a hot-deck imputation method. Such a shipment was considered a "recipient" if its SCTG code was valid, if one of the two data items (either shipment value or shipment weight) was reported or corrected and greater than zero, and if the shipment was otherwise useable.

The recipient's data item was imputed as follows: First, a donor shipment for a given recipient with the same 5-digit SCTG was selected at random from a pool of potential donor shipments (those with valid SCTGs and with reported or corrected shipment value and weight) in the same imputation cell. Then, the donor's value and weight data were used to calculate a ratio that was applied to the recipient's reported or corrected item to impute the item that was missing or failed the ratio edit. If a donor could not be found in one of the nine imputation cell levels, then the recipient's item was imputed using the median value-to-weight ratio of all shipments in the same SCTG as that of the recipient.

The definition of the imputation cells is provided in Table 10.

Table 8.
Definition of the SCTG Imputation Cells at Each Level During Phase 3

Level	Recipient has a UN/NA code	Recipient does not have a UN/NA code
1	Company ID x UN/NA x 2-digit SCTG	Establishment ID x 2-digit SCTG
2	UN/NA x 2-digit SCTG	Company ID x 2-digit SCTG
3	Company ID x 2-digit SCTG	Company ID x 2-digit SCTG
4	6-digit NAICS x 2-digit SCTG	6-digit NAICS x state x 2-digit SCTG
5	6-digit NAICS x 2-digit SCTG	6-digit NAICS x 2-digit SCTG

Note: SCTG is Standard Classification of Transported Goods. UN/NA is the United Nations or North American code for hazardous materials. NAICS is the North American Industry Classification System.
Source: U.S. Census Bureau, 2025.

Table 9.
Definition of the SCTG Imputation Cells at Each Level During Phase 4

Level	Recipient has a UN/NA code	Recipient does not have a UN/NA code
1	Company ID x UN/NA	Establishment ID
2	UN/NA	Company ID x NAICS category (the categories used for sampling)
3	Company ID	Company ID
4	6-digit NAICS x state	6-digit NAICS x state
5	6-digit NAICS	6-digit NAICS

Note: SCTG is Standard Classification of Transported Goods. UN/NA is the United Nations or North American code for hazardous materials. NAICS is the North American Industry Classification System.
Source: U.S. Census Bureau, 2025.

Table 10.
Definition of the Value/Weight Imputation Cells at Each Level

Level	Recipient has a UN/NA code	Recipient does not have a UN/NA code
1	5-digit SCTG x establishment ID x 6 shipment weight categories	5-digit SCTG x establishment ID x 6 shipment value categories
2	5-digit SCTG x company ID x 6 shipment weight categories	5-digit SCTG x company ID x 6 shipment value categories
3	5-digit SCTG x origin CFS Area x 6 shipment weight categories	5-digit SCTG x origin CFS Area x 6 shipment value categories
4	5-digit SCTG x establishment ID x 3 shipment weight categories	5-digit SCTG x establishment ID x 3 shipment value categories
5	5-digit SCTG x company ID x 3 shipment weight categories	5-digit SCTG x company ID x 3 shipment value categories
6	5-digit SCTG x origin CFS Area x 3 shipment weight categories	5-digit SCTG x origin CFS Area x 3 shipment value categories
7	5-digit SCTG x establishment ID	5-digit SCTG x establishment ID
8	5-digit SCTG x company ID	5-digit SCTG x company ID
9	5-digit SCTG x origin CFS Area	5-digit SCTG x origin CFS Area

Note: SCTG is Standard Classification of Transported Goods. CFS is Commodity Flow Survey. UN/NA is the United Nations or North American code for hazardous materials.
Source: U.S. Census Bureau, 2025.

Supplemental Table S1 gives the number of shipments imputed for value or weight.

Domestic Destination Imputation

A shipment's origin and domestic destination ZIP Codes were the primary inputs to determining the shipment's distance traveled (refer to the section titled **Mileage Calculation and Routing Software Changes**). Origin ZIP Codes were associated with each establishment when the frame was extracted from the Business Register. Domestic destination ZIP Codes were requested for each shipment in the questionnaire, along with domestic city/state and foreign destination information for export shipments. For all shipments, the reported or corrected domestic destination city, state, and ZIP Code were compared to a full list of ZIP Codes valid in 2022 along with their official associated city (i.e. the "recommended city name" associated with the ZIP Code on the U.S. Postal Service's ZIP Code lookup tool) and state. Confirmation of domestic destination city, state, and ZIP Code together helped to validate the response. The following steps outline the validation and imputation procedure for domestic destination city, state, and ZIP Code:

- The reported/corrected domestic destination ZIP Code was reduced to the first five digits in the event that respondents gave 9-digit codes (or any other response longer than five characters).
- If a reported ZIP Code matched a ZIP Code associated with a U.S. territory, overseas military postal code, or looks like a foreign postal code, then the shipment was flagged for correction to move that destination information into foreign destination fields.
- The following steps all checked for matches or near matches of reported/corrected city and ZIP Code. If any of these cases were true, the reported/corrected ZIP Code was confirmed.
    - City and ZIP Code matched a record on the official list.
    - City and ZIP Code matched a record on a secondary list compiled by the Census Bureau's Geography Division that gives ZIP Codes and a list of associated "alternate" names. Many of these alternate names matched names that appeared on the U.S. Postal Service's ZIP Code lookup tool as "other city names recognized" or even some "city names to avoid."
    - ZIP Code exactly matched a record on either list and the city nearly matched a record associated with that ZIP Code. Near matches were found using a function that scores how different two strings were from one another based on how many steps would be required to change one to the other. The score had to be within a threshold to be considered a near match.
    - ZIP Code exactly matched a record on either list and reported city appeared as a full "word" in a record associated with that ZIP Code or the city on the record appeared as a full "word" in the reported/corrected city. These conditions matched cases when reported city names were too abbreviated, if they had extra words like "township," or even if they contained full mailing addresses.
- If the reported/corrected city was blank (or something uninformative, like "N/A"), then if the reported/corrected ZIP Code had an exact match to the official list, we used that ZIP Code.
- If no matches were found from the prior steps, then we looked for exact matches of city to the official or secondary lists. The following steps were used to impute a ZIP Code in these cases:
    - We checked for any near matches with ZIP Code on the lists. Near matches for ZIP Code were found in the same way as for city, except the threshold was stricter, roughly looking to identify ZIP Codes where four out of five digits were correct. If there was at least one near match, it was imputed to the ZIP Code with the "closest" match.
    - If there were no near matches, and the reported/corrected state was valid, then we randomly imputed a ZIP Code associated with the city and state. The probability of selection for an associated ZIP Code was proportional to the number of shipments with that ZIP Code as a destination based on the matching steps above with a modification to favor ZIP Codes matched to the city on the official list.
    - If there were no near matches, and the reported/corrected state was not valid, then we randomly imputed a ZIP Code associated with the city in any state. The probability of selection followed the same rules as the prior step.
- If all the preceding methods failed, then any remaining shipment with a reported/corrected ZIP Code that matched the list correctly would keep the ZIP Code.
- Any shipment that could not be matched in any of the methods listed above would not be tabulated.
- One specific ZIP Code, 85288, split from the existing 85281 in the middle of 2022. For simplicity, we imputed any destination ZIP Code of 85288 back to 85281.

- In any step mentioned above, city and state were imputed to match the assigned ZIP Code for the shipment if they did not match already, but this operation only served to clean up the records. Tabulations for all levels of geography were based solely on the assigned ZIP Code.

Supplemental Table S1 gives the number of shipments imputed for destination and a number that were unable to be assigned a destination.

UN/NA (HAZMAT Code) Imputation

Shipments with certain SCTG codes were considered HAZMAT shipments, and the respondent should have reported a corresponding UN/NA code. For these shipments, if the UN/NA code was missing or invalid, then we used hot-deck imputation on missing or invalid UN/NA codes. In the hot-deck process, a shipment with a missing or invalid UN/NA code (called a recipient) was assigned the UN/NA code from a similar shipment (called a donor).

Supplemental Table S1 gives the number of shipments imputed for UN/NA code.

Temperature Control (TC) Imputation

The temperature control code (Yes or No) was an indication of whether the shipment required a temperature-controlled environment while being shipped. The type of commodity shipped determines whether the shipment needs TC. Some commodities always required TC, while others never required it. Still others may or may not have needed TC, depending on factors including, but not limited to, the specific product, the distance shipped, packaging, etc.

Missing or invalid temperature control codes were imputed based on the respondent-provided or imputed SCTG code for the commodity shipped. Respondent TC codes were preserved when they aligned with BTS guidance on TC. When respondent TC codes did not align, they were imputed. When the TC was not provided by the respondent, they were imputed. In the case of commodities that were neither always nor never TC, the default TC code was "No" when TC was not provided by the respondent.

Supplemental Table S1 gives the number of shipments imputed for TC code.

Shipment Distance

The CFS did not ask respondents to report the distance traveled for each shipment. However, origin and destination ZIP Codes were required from respondents. Using these ZIP Codes, a mileage estimate can be generated. To calculate a mileage for shipments collected during the 2022 CFS, we used Vincenty's formulae to compute the geodetic distance between origin and destination ZIP Codes. We informally refer to this as the Great Circle Distance (GCD).

Vincenty's formulae are considered to be more accurate estimates of the distance between two points on the Earth because the method is based on the assumption that the shape of the Earth is an oblate spheroid, compared to the Haversine formula and the GCD method that assume the shape of the Earth is spherical.

For domestic shipments, the mileage was calculated between the origin ZIP Code point and the destination ZIP Code point. For export shipments, the mileage was calculated between the origin ZIP Code point and the POE/U.S. territorial border.

The ZIP Code point was the latitude/longitude coordinate of the centroid of each ZIP Code for which ESRI Geocoder had been able to identify a centroid.

The ZIP Code area was an area of each ZIP Code in the United States for which ESRI Geocoder had been able to compute an area.

For intra-ZIP Code shipments (i.e., 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 of the distance shipped. If the ZIP Code area was not available, we set the distance to 1 mile.

Mode Imputation

In the 2017 CFS, a custom-built mileage routing and mode imputation tool, referred to as GeoMiler, made numerous corrections and imputations to both domestic and export mode of transportation, based on business rules provided by BTS. However, in the 2022 CFS, we replicated its functionality by developing in-house programming using similar business rules that GeoMiler used in the 2017 CFS. For the shipments that did not have modes after the rule-based program runs, we used a machine learning (ML) model to assign the modes if the ML model reported the predicted probability to be 1. For the shipments where the ML model reported the predicted probability to be less than 1, we let the mode equal unknown.

Supplemental Table S1 provides the number of shipments with mode imputed.

Domestic Destination Imputation—Identifying P.O. Box Exception Cases

Some ZIP Codes were identified in our records as mostly or entirely comprising P.O. Boxes. However, some of those ZIP Codes were associated with at least some typical addresses. We found a set of ZIP Codes were associated

with only P.O. Boxes. For those ZIP Codes, if a shipment was not using the parcel mode, then we determined that the destination ZIP Code would need to be replaced. For those shipments, we found the closest (based on GCD) neighboring ZIP Code that did ship to typical addresses and imputed that ZIP Code.

Supplemental Table S1 provides the number of shipments destinations updated in this process.

Since this procedure updated destination ZIP Codes, shipment distances were recalculated at this point. Because the P.O. Box imputations were designed to select the closest eligible ZIP Code, the resulting distances rarely changed by more than a few miles.

ESTIMATION

Estimates of total value and total weight were computed as the sum of weighted shipment data (reported, corrected, or imputed). Estimates of percent change and percent-of-total were computed using the appropriate estimates of totals. Estimates of average miles per shipment were computed by dividing the estimate of total miles traveled by the estimate of total number of shipments.

Weighting

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

CFS respondents provided data for either a sample of shipments or all shipments, for the selected week in each quarter. 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 component weights: the shipment weight, the shipment nonresponse weight, the quarter weight, and the quarter nonresponse weight. Three additional component weights were then applied to produce estimates corresponding to the population. These were the establishment-level adjustment weight, the establishment weight (i.e. the first stage sample weight), and the nonresponse poststratification 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 or all shipments the respondent reported on the questionnaire for the same week. If the shipments were sampled, this weight used 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 shipment. For example, a respondent may not have been able to provide value, weight, commodity description, or destination for one of the 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 was equal to the ratio of the number of sampled or all 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 was equal to 13. For each establishment, the quarterly estimates were added to produce an estimate of the establishment's total value of shipments for the entire survey year.

Whenever an establishment did not provide the Census Bureau with a response for each of its 4 reporting weeks, we computed a quarter nonresponse weight. The **quarter nonresponse weight** for a particular establishment was 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 shipment values, we computed an estimate of total value of shipments for the entire survey year for each establishment. 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 poststratification purposes. This weight, the **establishment-level adjustment weight**, attempts to correct for any sampling error caused by the selection of specific reporting weeks or specific shipments.

The adjusted estimate of total value of shipments for an establishment was then weighted by the **establishment weight**. This weight was equal to the reciprocal of the establishment's probability of being selected into the first stage sample (refer to the earlier **Sample Design** section).

A final adjustment, for most industries, the **nonresponse poststratification adjustment weight**, corrected 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 2022 Economic Census. This adjustment accounted 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 (2021) and the year in which the data were collected (2022).

The nonresponse poststratification cells were defined by industry (typically the 3-digit NAICS codes [for Manufacturing sector] or 4-digit NAICS codes [all other industries] used for sampling) and state.

For auxiliary (NAICS 4931 and 55114) and publishing (NAICS 5111 and 51223) establishments, the adjustment was performed using the MOS from the sampling frame or an estimate of the value of shipments from 2022 CFS survey data, rather than Economic Census data. Receipts for Auxiliary establishments were 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 did not involve the shipment of a commodity.

An exception to the description of the weighting procedure was made for what we call "certainty shipments." These were shipments about which we have learned the number of times they were made in the year. For these shipments, we let the shipment weight equal the number of times they were made in the year. We let the shipment nonresponse weight, the quarter weight, and the quarter nonresponse weight equal 1. And the remaining weights are computed as previously described.

For NAICS 4247, the 2022 Economic Census revenue used for this adjustment was reduced by the portion of the revenue that was derived from the sale of crude oil, as crude oil shipments are out of scope to the CFS.[3]

RELIABILITY OF THE ESTIMATES

The estimates may have differed from the true, 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 estimates, it is convenient to discuss total error as the sum of sampling error and nonsampling error. Sampling error is the 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.

[3] Based on North American Product Classification System-based collection code 4003325000.

The sampling error of the estimates in this publication can be estimated 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 total estimates and average estimates, the CV of the estimate was provided. For percentage estimates, such as percentage change or percentage of a total, the standard error of the estimate was 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 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 were often unavailable. Data users should be aware that the published estimates may be affected by unmeasured nonsampling error.

Suppressed Estimates

Estimates that had 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. More information is available in the **Disclosure Avoidance** section.

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

More detailed descriptions of sampling and nonsampling errors for the 2022 CFS are provided in the following sections.

SAMPLING ERROR

The estimates were based on a sample of shipments reported for a sample of weeks from a sample of establishments. Therefore, the estimates were unlikely to exactly agree with results that would be obtained from a complete enumeration of all shipments made 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 arose from each of the three stages of sampling.

The particular sample of shipments obtained by the CFS was 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 gave rise to a distribution of estimates for the population parameter. A statistical measure of the variability among these estimates was the standard error, which can be estimated from any one sample. The standard error is defined as the square root of the sampling 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 (refer to the **Disclosure Avoidance** section).

Note that measures of sampling variability, such as the standard error and coefficient of variation, were estimated from the sample and were 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, this detail was omitted. It is important to note that the standard error only measured sampling variability. It did not measure systematic biases of the sample, which falls on nonsampling error. 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 could 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 was a percentage of confidence, which is interpreted as follows.

If, for each possible sample, an estimate of a population parameter and its standard error were obtained, then:

- 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.
- 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, were 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 10 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 shipments estimate by its coefficient of variation in decimal. 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. It should be noted that CV in the publication is in percentage.

For estimates that were computed from relatively few shipments, the variance estimate may have been computed from fewer than 10 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 many sources:

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

Although no direct measurement of the potential biases due to nonsampling error were obtained, precautionary steps were taken in all phases of the collection, processing, and tabulation of the data 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.

The third stage of the CFS sample uses respondent-conducted sampling. Some possible sources of bias that were attributed to respondent-conducted sampling included:

- 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, corresponding to the three stages of the sample design:

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

Item nonresponse occurs either when a particular data item of a shipment is unanswered or the response to the question fails computer or analyst edits. Nonresponse to data items were corrected by imputation. (Refer to the **Imputation** sections 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 were adjusted for by reweighting (refer to the descriptions of the shipment and quarter nonresponse weights in the previous **Estimation** section). Reweighting assumes that the unreported shipments in a quarter have the same distribution of characteristics as the reported shipments in the same quarter or that the shipments in unreported quarters have the same distribution of characteristics as the shipments in reported quarters from the same shipper. The amount of bias introduced by this nonresponse adjustment procedure depended on the extent to which the nonrespondents differed, characteristically, from the respondents.

Establishment nonresponse was adjusted for during the estimation procedure by the nonresponse poststratification adjustment weight. In most cases of establishment nonresponse, the respondents did not provide data for any of their 4 reporting weeks, despite several attempts to elicit a response.

Response Rates

The CFS produced five 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 four were based on the responses of the establishments selected into the survey. The fifth rate was based on the quality of the individual shipment data reported by the responding establishments.

Participation Response Rate (PRR)—The participation response rate was the total unweighted number of establishments that provided usable data divided by the total number of establishments in the sample (expressed as a percentage).[4]

Cooperation Rate—The cooperation rate was defined as the total unweighted number of establishments that provided shipment or other data to the CFS—whether such data were included in the estimates—divided by the sample size of establishments (and expressed as a percentage). It indicated the extent to which contacted establishments cooperated with the request to participate in the CFS.

Unit Response Rate (URR)—The unit response rate was 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.

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

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 was defined as the percentage of the total weighted MOS of the establishments that provided usable data to the total weighted sampling measure of size of all establishments that were eligible (or potentially eligible) for data collection. This incorporated the size of the establishment as well as its establishment (first-stage sample) weight.

Total Quantity Response Rate (TQRR)—The total quantity response rate was defined as the percentage of the estimated (weighted) total of a given data item that was based on reported shipment data or from sources determined to be of equivalent-quality-to-reported data. The TQRR was an item-level indicator of the "quality" of each estimate. In contrast to the URR, the TQRR was computed for an individual data item, so CFS produced two TQRRs: one for shipment value and another for shipment weight.

The five response rates appear in the supplementary tables S2 and S3.

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.

Using disclosure avoidance procedures, the Census Bureau modified or removed 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 was 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 the two key items (shipment value and weight). Disclosure protection is accomplished in a manner that causes most cell values to be perturbed by at most a few percentage points. For sample-based tabulations such as CFS, the estimated coefficient of variation for a published cell includes both the estimated sampling error and the amount of perturbation in the estimated cell value due to noise. Some cells in the table may be suppressed because the quality of the data did not meet publication standards. 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 has reviewed the published CFS tables to ensure appropriate access, use, and disclosure avoidance protection of the confidential source data. (Project Number 7504831, Disclosure Review Board [DRB] Approval Number: CBDRB-FY25-0142).

COMPARABILITY OF ESTIMATES

This section summarizes the definitional, coding, and processing differences between the 2022 and 2017 (and prior) surveys that limit the comparability of the estimates across the survey years. Data users should exercise caution when comparing CFS estimates across survey years.

Industry Coverage Changes

Industry coverage had changed slightly from survey year to survey year (refer to Table 19). The details of the 2022 CFS industry coverage were described in the **Industry Coverage** section. The most significant recent changes were:

- NAICS 484 was included as an in-scope auxiliary industry in 2022, 2017, and 2012 but not in any prior surveys.
- NAICS 51223 (Music Publishers) was included as an in-scope publishing industry in 2022 and 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 2022 estimates were based on the industry classification of the sample establishments at the time those estimates were produced (May 2025). The 2017 and earlier estimates are never revised to account for subsequent industry classification changes to the sample establishments.

Changes to Data Items Collected

Table 11 summarizes the shipment data items requested from each sampled establishment in a reporting period for the past seven surveys.

Table 12 summarizes the establishment level data collected from each sampled establishment (for each quarter).

Table 11.
Data Items Collected for Each Shipment

Data item	Survey years				
	1993	1997	2002 and 2007	2012 and 2017	2022
Company shipment ID	C	C	C	C	C
Shipment date	C	C	C	C	C
Total value	C	C	C	C	C
Total weight	C	C	C	C	C
Commodity code	STCC[1]	SCTG[2]	SCTG	SCTG	Usually not collected[3]
Commodity description	C	C	C	C	C
Mode of transport to U.S. destination	C	C	C	C	C
Domestic destination (city, state, ZIP Code)	C	C	C	C	C
Containerized? (Y/N)	C	C	X	X	X
Intermodal shipment? (Y/N)	X	X	C	X	X
Temperature controlled? (Y/N)	X	X	X	C	C
Hazardous material? (Y/N)	C	X	X	X	X
HAZMAT (UN/NA) code	X	C	C	C	C
Export? (Y/N)	C	C	C	C	C
Export destination (city, country)	C	C	C	C	C
Export mode	C	C	C	C	C

C Data collected.
X Not applicable; data not collected.
[1] Standard Transportation Commodity Code.
[2] Standard Classification of Transported Goods.
[3] Except for the situation described in the SCTG (Standard Classification of Transported Goods) Code Imputation section.
Source: U.S. Census Bureau, 2025.

Table 12.
Data Items Collected From Each Establishment (Each Reporting Period)

Data item	Survey years					
	1993	1997 and 2002	2007	2012	2017	2022
Verification of shipping address	C	C	C	C	C	C
Verification of mailing address	X	X	X	C	C	C
Operating status	C	C	C	C	C	C
Length of reporting period	2 weeks	1 week	1 week	1 week	1 week	1 week
Total number of outbound shipments for the reporting period	C	C	C	C	C	C
Total value of weekly shipments	X	X	X	X	C	C
Monthly value of outbound shipment	C	C	C	C	X	X
Third party logistics (3PL) usage[1]	X	X	C		X	X
Rush delivery usage	X	X	X	C		
Primary activity correct? (Y/N)	X	X	X		C	C
Time to complete survey (hours, minutes; In 2017, this was asked only of respondents who filled out the paper form. In 2022, there was no paper form.)	X	X	X	X	C	C
Contact information	C	C	C	C	C	C
Prior year estimated total shipment value	X	X	X	X	X	C

C Data collected.
X Not applicable; data not collected.
[1] Only collected on the 4th quarter questionnaire.
Source: U.S. Census Bureau, 2025.

Geographic Area Changes

CFS Area Changes From 2017 to 2022

Two new CFS Areas were added: the Toledo-Findlay-Tiffin, OH CSA and the Des Moines-Ames-West Des Moines, IA CSA. The former has seven counties and the latter has ten. As a result, the Remainder of Ohio CFS Area is considerably smaller, and the State of Iowa CFS Area is now the Remainder of Iowa. Since these are significant changes, calculations of percent change from 2017 to 2022 for Remainder of Ohio and Remainder of Iowa were suppressed as "not comparable" to the 2017 CFS Areas.

Additionally, the "PA" part of the New York-Newark, NY-NJ-CT-PA CSA reduced in size from five counties to two. The remainder did not look to be large enough to remain as a CFS Area, but the PA part of the Allentown-Bethlehem-Easton PA-NJ MSA contained the other three counties of the five with most of the shipping activity. It was decided to replace the New York-Newark, NY-NJ-CT-PA CFS Area (PA part) with the Allentown-Bethlehem-Easton, PA-NJ CFS Area (PA part). However, like the Remainder of Ohio and Remainder of Iowa CFS Areas, calculations of percent change from 2017 to 2022 for Allentown-Bethlehem-Easton, PA-NJ (PA part) were suppressed as "not comparable" rather than being compared to the 2017 results for New York-Newark, NY-NJ-CT-PA (PA part).

Several other CFS Areas used different CSAs/MSAs from 2017 or the same CSA/MSA with a new code. For example, Knoxville-Morristown-Sevierville, TN, comprised the same counties in 2022 as it did in 2017, but its CSA code changed from 314 to 315. The CFS Area that includes Phoenix, Arizona, added a county between 2017 and 2022 and also changed from an MSA (38060) to a CSA (429). Other than the situations in the prior two paragraphs, percent changes from 2017 to 2022 were not suppressed.

Many other CFS Areas changed slightly from 2017 to 2022, adding or losing a small number of counties. A full list of changes is given in Table 13. Situations where only the name of the CFS Area changed without component counties changing or the CSA/MSA code changing are omitted.

CFS Area Changes From 2012 to 2017

No new CFS Areas were defined for the 2017 CFS. However, some CFS Areas, while similar in name from one survey to the next, were 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. 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 14 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 changes are summarized in Table 15.

In 2022, for the first time, the Census Bureau made estimates by "customer pick up" and "unknown mode." "Customer pick up" is considered a component of the truck mode. Because of this addition, calculations of percent change from 2017 to 2022 for all detailed truck modes were suppressed as "not comparable" to the 2017 CFS estimates. Additionally, reported "other mode" shipments, typically conveyor belt shipments, are now classified as "other single mode" in the estimates. This was done to further distinguish these shipments from the existing "other multiple mode" estimate published in the past surveys. Other multiple mode shipments typically involve a combination of truck, rail, and water modes.

In 2022, we also recoded the domestic modes so that the modes would be grouped together in a nested format. The single mode codes now start with '1'; multiple mode codes start with '2'; and unknown mode starts with '3'. A second character splits out the different single and multiple modes (e.g., '11' represents truck and '21' represents parcel, U.S.P.S., or courier). A third character further splits out selected modes like truck and water (e.g., '111' represents for-hire truck, '112' represents company-owned truck, and '113' represents customer pick up).

Table 13.
CFS Area Definition Changes From 2017 to 2022

2022 CFS area		2017 CFS area		Description of change[1]
142	Birmingham-Hoover-Talladega, AL	142	Birmingham-Hoover-Talladega, AL	Coosa County, AL and Tallapoosa County, AL removed from the CFS Area.
380	Mobile-Daphne-Fairhope, AL	380	Mobile-Daphne-Fairhope, AL	Washington County, AL added to the CFS Area.
429	Phoenix-Mesa, AZ	38060	Phoenix-Mesa, Scottsdale AZ	Gila County, AZ added to the CFS Area.
260	Fresno-Madera-Hanford, CA	260	Fresno-Madera, CA	Kings County, CA added to the CFS Area.
488	San Jose-San Francisco-Oakland, CA	488	San Jose-San Francisco-Oakland, CA	Merced County, CA and Stanislaus County, CA added to the CFS Area.
370	Miami-Port St. Lucie-Fort Lauderdale, FL	370	Miami-Fort Lauderdale-Port St. Lucie, FL	Okeechobee County, FL removed from and Monroe County, FL added to the CFS Area.
422	Orlando-Lakeland-Deltona, FL	422	Orlando-Deltona-Daytona Beach, FL	Hardee County, FL and Polk County, FL added to the CFS Area.
122	Atlanta-Athens-Clarke County-Sandy Springs, GA-AL (GA part)	122	Atlanta-Athens-Clarke County-Sandy Springs, GA	Gordon County, GA removed from, and Floyd County, GA, Habersham County, GA, and Stephens County, GA added to the CFS Area.
496	Savannah-Hinesville-Statesboro, GA	496	Savannah-Hinesville-Statesboro, GA	Wayne County, GA added to the CFS Area.
218	Des Moines-Ames-West Des Moines, IA	X	X	New CFS Area, including Boone, Dallas, Guthrie, Jasper, Madison, Mahaska, Marion, Polk, Story, and Warren counties, IA.
556	Wichita-Winfield, KS	556	Wichita-Arkansas City-Winfield, KS	Kingman County, KS removed from the CFS Area.
350	Louisville/Jefferson County-Elizabeth-town-Bardstown, KY-IN (KY part)	350	Louisville/Jefferson County-Elizabeth-town-Madison, KY-IN (KY part)	Trimble County, KY removed from the CFS Area.
12940	Baton Rouge, LA	12940	Baton Rouge, LA	Assumption Parish, LA added to the CFS Area.
266	Grand Rapids-Kentwood-Muskegon, MI	266	Grand Rapids-Wyoming-Muskegon, MI	Barry County, MI removed from the CFS Area.
378	Minneapolis-St. Paul, MN-WI (MN part)	378	Minneapolis-St. Paul, MN-WI (MN part)	Sibley County, MN removed from and Steele County, MA added to the CFS Area.
408	New York-Newark, NY-NJ-CT-PA (NJ part)	408	New York-Newark, NY-NJ-CT-PA (NJ part)	No change to the CFS Area despite Warren County, NJ no longer being part of the associated CSA.
172	Charlotte-Concord, NC-SC (NC part)	172	Charlotte-Concord, NC-SC (NC part)	Anson County, NC added to the CFS Area.
450	Raleigh-Durham-Cary, NC	450	Raleigh-Durham-Chapel Hill, NC	Harnett County, NC and Lee County, NC removed from the CFS Area.
184	Cleveland-Akron-Canton, OH	184	Cleveland-Akron-Canton, OH	Wayne County, OH added to the CFS Area.
534	Toledo-Findlay-Tiffin, OH	X	X	New CFS Area, including Fulton, Hancock, Lucas, Ottawa, Sandusky, Seneca, and Wood Counties, OH.
538	Tulsa-Muskogee-Bartlesville, OK	538	Tulsa-Muskogee-Bartlesville, OK	Cherokee County, OK removed from the CFS Area.
10900	Allentown-Bethlehem-Easton, PA-NJ (PA part)	408	New York-Newark, NY-NJ-CT-PA (PA part)	Monroe County, PA and Pike County PA removed from the CFS Area.
273	Greenville-Spartanburg-Anderson, SC	273	Greenville-Spartanburg-Anderson, SC	Abbeville County, SC removed from the CFS Area.
315	Knoxville-Morristown-Sevierville, TN	314	Knoxville-Morristown-Sevierville, TN	No change to the CFS Area other than the code.
400	Nashville-Davidson-Murfreesboro, TN	400	Nashville-Davidson-Murfreesboro, TN	Hickman County, TN removed from the CFS Area.
204	Corpus Christi-Kingsville-Alice, TX	204	Corpus Christi-Kingsville-Alice, TX	Duval County, TX added to the CFS Area.
206	Dallas-Fort Worth, TX-OK (TX part)	206	Dallas-Fort Worth, TX-OK (TX part)	Hopkins County, TX and Somervell County, TX removed from the CFS Area.
288	Houston-The Woodlands, TX	288	Houston-The Woodlands, TX	Trinity County, TX removed from the CFS Area.
484	San Antonio-New Braunfels-Pearsall, TX	41700	San Antonio-New Braunfels, TX	Frio County, TX added to the CFS Area.
13140	Beaumont-Port Arthur, TX	13140	Beaumont-Port Arthur, TX	Newton County, TX removed from the CFS Area.
545	Virginia Beach-Norfolk, VA-NC (VA part)	545	Virginia Beach-Norfolk, VA-NC (VA part)	Southhampton County, VA and Franklin City, VA added to the CFS Area.
40060	Richmond, VA	40060	Richmond, VA	Caroline County, VA removed from and King and Queen County, VA added to the CFS Area.
47900	Washington-Arlington-Alexandria, DC-VA-MD-WV (VA part)	47900	Washington-Arlington-Alexandria, DC-VA-MD-WV (VA part)	Madison County, VA added to the CFS Area.

X Not applicable.
[1] The corresponding Remainder of State CFS Areas added or lost the counties added to the CFS Areas described in the table. The State of Iowa CFS Area became the Remainder of Iowa CFS Area after the addition of Des Moines-Ames-West Des Moines, IA.
Source: U.S. Census Bureau, 2025.

Table 14.
Commodity Flow Survey (CFS) Area Definition Changes From 2012 to 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 Remainder of State CFS Areas lost the counties added to the CFS Areas described in the table.
Source: U.S. Census Bureau, 2025.

Table 15.
Reported Mode of Transportation

Survey year				
1993	1997, 2002, and 2007	2012	2017	2022
For-hire truck	For-hire truck	For-hire truck	For-hire truck	For-hire truck
Private truck	Private truck	Private truck	Company-owned truck	Company-owned truck
Rail	Rail	Rail	Rail	Rail
Air	Air	Air	Air	Air
Inland water	Shallow draft	Inland water	Inland water	Inland water
X	X	X	X	Great Lakes
Deep sea water	Deep draft vessel	Deep sea	Deep sea	Deep sea
Pipeline	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	Parcel, U.S. Postal Service, or courier
Other	Other	Other	Other	Other mode
Unknown	Unknown	Unknown	Unknown	Unknown
X	X	X	X	Customer pick up

X Not applicable.
Source: U.S. Census Bureau, 2025.

As presented in Table 15, the 2012 mode category "private truck" was renamed "company-owned truck" in 2017.

There were no changes to the published detailed mode of transportation categories associated with water-borne shipments between 2012, 2017, and 2022. Only the codes changed in 2022. Table 16 lists the published water modes in 2007, 2012, 2017, and 2022. Refer to the 2007, 2012, 2017, and 2022 questionnaires and instruction guides at <www.census.gov/programs-surveys/cfs/technical-documentation/questionnaires.html> for descriptions of these modes.

In 2012, export shipments that travelled by a single mode (truck, for example) to the 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 were classified as multimode truck and water shipments and include the domestic water mileage to the U.S. territorial boundary.

Mileage Calculation and Routing Software Changes

2022 and 2017

In the 2017 CFS, we calculated the distance traveled using GeoMiler, a custom-built mileage routing and mode imputation tool. However, for the 2022 CFS, after soliciting input from the CFS data user community, we decided to simplify shipment mileage estimation by using GCD (great circle distance). GCD uses Vincenty's formulae, which are commonly used for measuring distances on the Earth, and are known for higher accuracy, especially for long distances.

Additionally for the 2022 CFS, we removed the mileage limit for company-owned truck shipments.

2017 and 2012

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

Table 16.
Published Water Mode Codes

2007		2012 and 2017		2022	
Code	Meaning	Code	Meaning	Code	Meaning
07	Water	07	Water	13	Water
08	Shallow draft	08	Inland water	131	Inland water
09	Great Lakes	09	Great Lakes	132	Great Lakes
10	Deep draft	10	Deep sea	133	Deep sea
		101	Multiple waterways	134	Multiple waterways

Source: U.S. Census Bureau, 2025.

Table 17.
Other Modes of Transportation
(Value amounts in millions of dollars. Weight amounts in thousands of tons)

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

Source: U.S. Census Bureau, 2025.

- 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 nonparcel mode—usually a truck mode.
- For 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 (called "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 recode 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 17 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 POE were classified as (domestic) truck and rail shipments in 2012. In 2017, these shipments now had three domestic legs (truck, rail, and water) and were classified into "other multiple modes."

More details about mileage calculation and related processing can be found in the **Mileage Calculation** section of the survey methodology.

Commodity Coding Changes

2022

There were no changes or additions to the definitions of commodities from 2017 to 2022.

2017

There were no changes or additions to the definitions of commodities from 2012 to 2017. However, the "-R" suffixes attached to SCTGs that were redefined in 2012 have been dropped (Table 18).

2012

Several commodities in SCTGs 07, 08, 17, and 18 were redefined for 2012. Refer to the "Commodity Coding Changes for 2012" table in the **Data Collection** section of the 2012 CFS survey methodology for the details of these changes.

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. Refer to the **Sample Design** sections of the survey methodology for further information.

Table 18.
Standard Classification Transportable Goods (SCTG) Code Changes

SCTG	
2012	2017
07-R	07
074-R	074
0743-R	0743
08-R	08
083-R	083
0831-R	0831
17-R	17
171-R	171
172-R	172
1720-R	1720
18-R	18

Source: U.S. Census Bureau, 2025.

For example, a particular combination of origin, destination, commodity, and mode may be common in one survey but rare or nonexistent in the next survey. While this may reflect true changes in economic activity, it may also result from (1) failing to select the establishments making these shipments, (2) if selected, the selected establishments failing to respond, or (3) if responding, the responding establishments failing to include shipments with this combination of characteristics in the sample of shipments provided to the Census Bureau.

APPENDIX A.

Table A-1.
Industry Coverage Changes

Survey years					
1993 and 1997	2002	2007	2012	2017	2022
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.	Establishments classified based on 2017 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 covered.[1]	Publishers (5111 and 51223) were covered.[1]	Publishers (5111 and 51223) were covered.[1]
Logging covered—under Manufacturing Division.	Logging not covered.[2]	Logging not covered.[2]	Logging not covered.	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).	Manufacturing (all industries).
Mining (except mining services [SICs 108, 124, 138, 148] and oil and gas extraction [SICs 131 and 132]).	Mining (except Oil and Gas [NAICS 212]).	Mining (except Oil and Gas [NAICS 212]).	Mining (except Oil and Gas [NAICS 212]).	Mining (except Oil and Gas [NAICS 212]).	Mining (except Oil and Gas [NAICS 212]).
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).	Retail—electronic shopping and mail-order houses, fuel dealers.	Retail—electronic shopping and mail-order houses, fuel dealers.
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, mail-order houses, fuel dealers.	Retail—electronic shopping, mail-order houses, fuel dealers.
Auxiliaries (managing offices, warehouses).	Auxiliaries (managing offices, warehouses).	Auxiliaries (managing offices, warehouses).[3]	Auxiliaries (managing offices, warehouses).[3]	Auxiliaries (managing offices, warehouses).[3]	Auxiliaries (managing offices, warehouses).[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 website.

[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.

2022 CFS: A targeted advance survey was not conducted.

Source: U.S. Census Bureau, 2025.

Table A-2.
Survey Years

2017	2022
Establishments classified based on 2012 NAICS.	Establishments classified based on 2017 NAICS.
Publishers (5111 and 51223) were covered.[1]	Publishers (5111 and 51223) were covered.[1]
Logging not covered.[2]	Logging not covered.[2]
Manufacturing (all industries).	Manufacturing (all industries).
Mining (except Oil and Gas [NAICS 212]).	Mining (except Oil and Gas [NAICS 212]).
Wholesale (merchants and manu- facturers' sales branches and own brand importers).	Wholesale (merchants and manufacturers' sales branches and own brand importers).
Retail—electronic shopping and mail-order houses, fuel dealers.	Retail—electronic shopping and mail-order houses, fuel dealers.
Auxiliaries (managing offices, ware- houses 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 website.

[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.

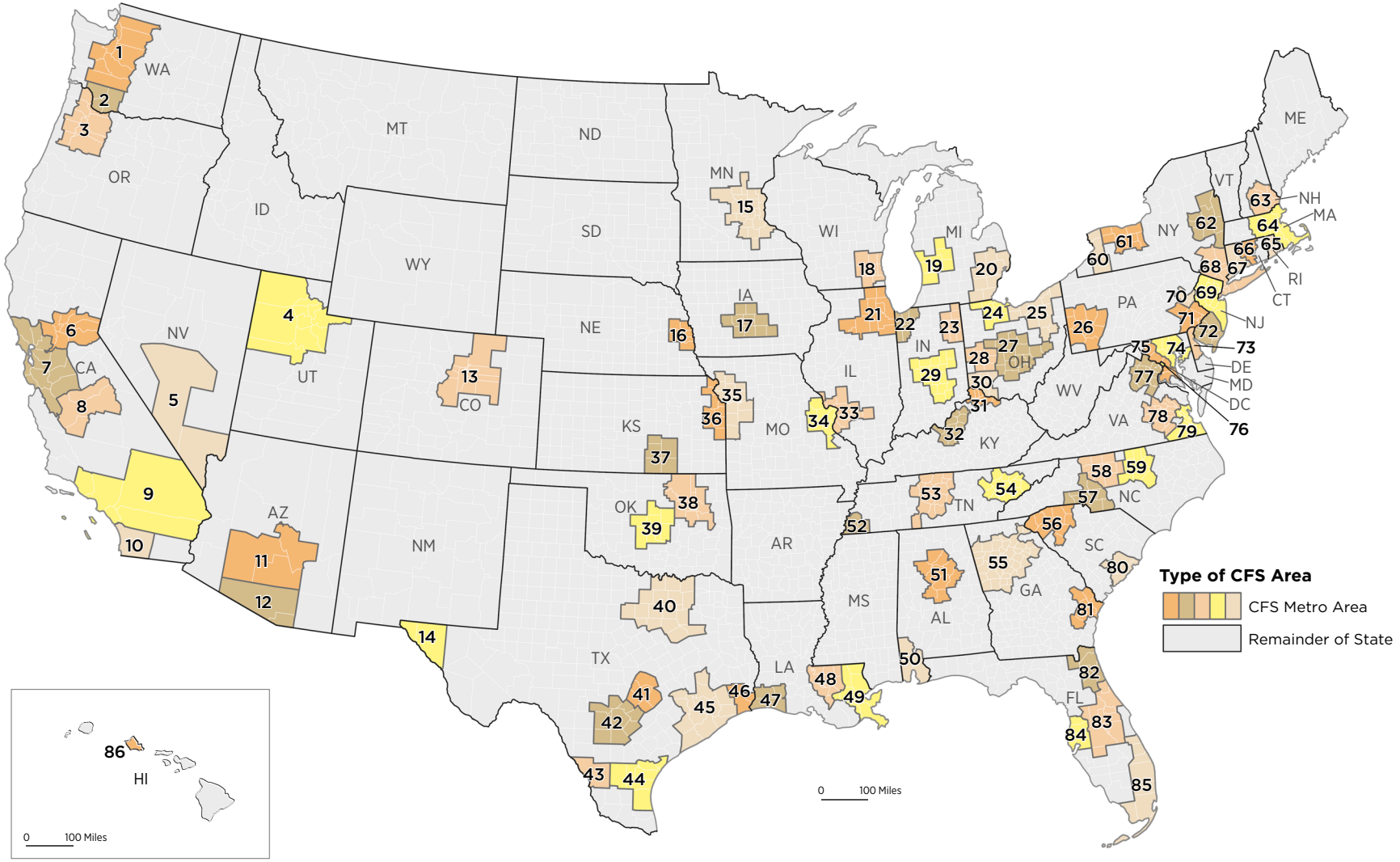
2012 CFS: A targeted advance survey of approximately 100,000 establishments was conducted in 2011 to identify those establishments that actually conduct shipping activities. In general, though not always, surveyed establishments that reported that they did not conduct any shipping activity were excluded 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.

2022 CFS: A targeted advance survey was not conducted.

Source: U.S. Census Bureau, 2025.

Figure B-1.
2022 Commodity Flow Survey (CFS) Areas



Note: All of Alaska is "Remainder of State."
Source: U.S. Census Bureau, 2025.

Table B-1.
2022 CFS Areas Map Legend With Frame and Sample Size

State	Map Label	CFS Area Code	CFS Area Description	2022 Frame—Approximate Number of Establishments	2022 Sample—Approximate Number of Establishments
AK		99999	Remainder of Alaska	1,400	650
AL	51	142	Birmingham-Hoover-Talladega, AL CFS Area	2,800	900
	50	380	Mobile-Daphne-Fairhope, AL CFS Area	1,300	550
		99999	Remainder of Alabama	5,100	1,200
AR		99999	Remainder of Arkansas	6,700	2,100
AZ	11	429	Phoenix-Mesa, AZ CFS Area	8,500	1,700
	12	536	Tucson-Nogales, AZ CFS Area	1,600	600
		99999	Remainder of Arizona	1,500	600
CA	8	260	Fresno-Madera-Hanford, CA CFS Area	1,900	650
	9	348	Los Angeles-Long Beach, CA CFS Area	58,000	7,200
	6	472	Sacramento-Roseville, CA CFS Area	4,200	1,100
	7	488	San Jose-San Francisco-Oakland, CA CFS Area	20,500	3,300
	10	41740	San Diego-Chula Vista-Carlsbad, CA CFS Area	7,600	1,500
		99999	Remainder of California	6,300	1,300
CO	13	216	Denver-Aurora, CO CFS Area	8,500	1,800
		99999	Remainder of Colorado	4,600	1,200
CT	67	408	New York-Newark, NY-NJ-CT-PA CFS Area (CT Part)	4,500	1,100
	66	25540	Hartford-East Hartford-Middletown, CT CFS Area	2,900	850
		99999	Remainder of Connecticut	600	350
DC	76	47900	Washington-Arlington-Alexandria, DC-VA-MD-WV CFS Area (DC Part)	550	350
DE	73	428	Philadelphia-Reading-Camden, PA-NJ-DE-MD CFS Area (DE Part)	1,700	650
		99999	Remainder of Delaware	450	300
FL	82	300	Jacksonville-St. Marys-Palatka, FL-GA CFS Area (FL Part)	2,700	900
	85	370	Miami-Port St. Lucie-Fort Lauderdale, FL CFS Area	22,000	3,300
	83	422	Orlando-Lakeland-Deltona, FL CFS Area	7,300	1,500
	84	45300	Tampa-St. Petersburg-Clearwater, FL CFS Area	6,300	1,400
		99999	Remainder of Florida	8,500	1,800
GA	55	122	Atlanta-Athens-Clarke County-Sandy Springs, GA-AL CFS Area (GA Part)	14,500	3,000
	81	496	Savannah-Hinesville-Statesboro, GA CFS Area	850	450
		99999	Remainder of Georgia	5,700	1,300
HI	86	46520	Urban Honolulu, HI CFS Area	1,600	600
		99999	Remainder of Hawaii	750	400
IA	17	218	Des Moines-Ames-West Des Moines, IA CFS Area	1,800	650
		99999	Remainder of Iowa	6,700	1,500
ID		99999	Remainder of Idaho	4,400	1,100
IL	21	176	Chicago-Naperville, IL-IN-WI CFS Area (IL Part)	22,000	3,500
	33	476	St. Louis-St. Charles-Farmington, MO-IL CFS Area (IL Part)	1,100	550
		99999	Remainder of Illinois	6,900	1,700
IN	22	176	Chicago-Naperville, IL-IN-WI CFS Area (IN Part)	1,500	600
	23	258	Fort Wayne-Huntington-Auburn, IN CFS Area	1,900	700
	29	294	Indianapolis-Carmel-Muncie, IN CFS Area	5,000	1,200
		99999	Remainder of Indiana	7,200	1,600
KS	36	312	Kansas City-Overland Park-Kansas City, MO-KS CFS Area (KS Part)	2,400	850
	37	556	Wichita-Winfield, KS CFS Area	1,400	550
		99999	Remainder of Kansas	3,300	1,000
KY	31	178	Cincinnati-Wilmington-Maysville, OH-KY-IN CFS Area (KY Part)	900	450
	32	350	Louisville/Jefferson County-Elizabethtown-Bardstown, KY-IN CFS Area (KY Part)	2,400	900
		99999	Remainder of Kentucky	4,900	1,300
LA	47	324	Lake Charles-Jennings, LA CFS Area	400	300
	49	406	New Orleans-Metairie-Hammond, LA-MS CFS Area (LA Part)	2,500	850
	48	12940	Baton Rouge, LA CFS Area	1,500	700
		99999	Remainder of Louisiana	3,900	1,100

Table continued on next page.

Table B-1.
2022 CFS Areas Map Legend With Frame and Sample Size—Con.

State	Map Label	CFS Area Code	CFS Area Description	2022 Frame—Approximate Number of Establishments	2022 Sample—Approximate Number of Establishments
MA	64	148	Boston-Worcester-Providence, MA-RI-NH-CT CFS Area (MA Part)	12,000	2,400
		99999	Remainder of Massachusetts	1,700	600
MD	74	12580	Baltimore-Columbia-Towson, MD CFS Area	4,400	1,200
	75	47900	Washington-Arlington-Alexandria, DC-VA-MD-WV CFS Area (MD Part)	2,800	900
		99999	Remainder of Maryland	1,300	550
ME		99999	Remainder of Maine	3,500	950
MI	20	220	Detroit-Warren-Ann Arbor, MI CFS Area	12,000	2,100
	19	266	Grand Rapids-Kentwood-Muskegon, MI CFS Area	4,100	1,000
		99999	Remainder of Michigan	6,900	1,300
MN	15	378	Minneapolis-St. Paul, MN-WI CFS Area (MN Part)	10,000	2,200
		99999	Remainder of Minnesota	4,500	1,100
MO	35	312	Kansas City-Overland Park-Kansas City, MO-KS CFS Area (MO Part)	2,800	900
	34	476	St. Louis-St. Charles-Farmington, MO-IL CFS Area (MO Part)	5,200	1,600
		99999	Remainder of Missouri	5,500	1,300
MS		99999	Remainder of Mississippi	4,800	1,200
MT		99999	Remainder of Montana	3,100	950
NC	57	172	Charlotte-Concord, NC-SC CFS Area (NC Part)	6,100	1,700
	58	268	Greensboro-Winston-Salem-High Point, NC CFS Area	4,100	1,100
	59	450	Raleigh-Durham-Cary, NC CFS Area	3,600	1,000
		99999	Remainder of North Carolina	7,400	1,500
ND		99999	Remainder of North Dakota	2,500	800
NE	16	420	Omaha-Council Bluffs-Fremont, NE-IA CFS Area (NE Part)	1,800	650
		99999	Remainder of Nebraska	3,200	850
NH	63	148	Boston-Worcester-Providence, MA-RI-NH-CT CFS Area (NH Part)	2,900	800
		99999	Remainder of New Hampshire	800	400
NJ	69	408	New York-Newark, NY-NJ-CT-PA CFS Area (NJ Part)	18,000	3,200
	72	428	Philadelphia-Reading-Camden, PA-NJ-DE-MD CFS Area (NJ Part)	3,400	950
NM		99999	Remainder of New Mexico	3,200	1,000
NV	5	332	Las Vegas-Henderson, NV CFS Area	3,700	1,100
		99999	Remainder of Nevada	2,100	750
NY	62	104	Albany-Schenectady, NY CFS Area	2,200	800
	60	160	Buffalo-Cheektowaga-Olean, NY CFS Area	2,700	850
	68	408	New York-Newark, NY-NJ-CT-PA CFS Area (NY Part)	33,500	4,600
	61	464	Rochester-Batavia-Seneca Falls, NY CFS Area	2,700	800
		99999	Remainder of New York	4,600	1,100
OH	30	178	Cincinnati-Wilmington-Maysville, OH-KY-IN CFS Area (OH Part)	4,000	1,200
	25	184	Cleveland-Akron-Canton, OH CFS Area	10,500	2,200
	27	198	Columbus-Marion-Zanesville, OH CFS Area	4,300	1,200
	28	212	Dayton-Springfield-Kettering, OH CFS Area	2,300	700
	24	534	Toledo-Findlay-Tiffin, OH	1,900	700
		99999	Remainder of Ohio	4,200	1,000
OK	39	416	Oklahoma City-Shawnee, OK CFS Area	2,800	800
	38	538	Tulsa-Muskogee-Bartlesville, OK CFS Area	2,700	800
		99999	Remainder of Oklahoma	2,400	850
OR	3	440	Portland-Vancouver-Salem, OR-WA CFS Area (OR Part)	7,100	1,500
		99999	Remainder of Oregon	3,800	1,000
PA	71	428	Philadelphia-Reading-Camden, PA-NJ-DE-MD CFS Area (PA Part)	9,400	2,200
	26	430	Pittsburgh-New Castle-Weirton, PA-OH-WV CFS Area (PA Part)	5,500	1,300
	70	10900	Allentown-Bethlehem-Easton, PA-NJ CFS Area (PA Part)	1,600	600
		99999	Remainder of Pennsylvania	11,500	2,200
RI	65	148	Boston-Worcester-Providence, MA-RI-NH-CT CFS Area (RI Part)	2,500	850

Table continued on next page.

Table B-1.
2022 CFS Areas Map Legend With Frame and Sample Size—Con.

State	Map Label	CFS Area Code	CFS Area Description	2022 Frame—Approximate Number of Establishments	2022 Sample—Approximate Number of Establishments
SC	56	273	Greenville-Spartanburg-Anderson, SC CFS Area	3,300	1,000
	80	16700	Charleston-North Charleston, SC CFS Area	1,400	550
		99999	Remainder of South Carolina	4,400	1,200
SD		99999	Remainder of South Dakota	2,700	850
TN	54	315	Knoxville-Morristown-Sevierville, TN CFS Area	2,200	750
	52	368	Memphis-Forrest City, TN-MS-AR CFS Area (TN Part)	2,000	750
	53	400	Nashville-Davidson-Murfreesboro, TN CFS Area	4,200	1,400
		99999	Remainder of Tennessee	4,800	1,200
TX	44	204	Corpus Christi-Kingsville-Alice, TX CFS Area	850	450
	40	206	Dallas-Fort Worth, TX-OK CFS Area (TX Part)	16,000	3,100
	14	238	El Paso-Las Cruces, TX-NM CFS Area (TX Part)	1,500	550
	45	288	Houston-The Woodlands, TX CFS Area	15,500	3,200
	42	484	San Antonio-New Braunfels-Pearsall, TX CFS Area	3,600	1,100
	41	12420	Austin-Round Rock-Georgetown, TX CFS Area	4,200	1,200
	46	13140	Beaumont-Port Arthur, TX CFS Area	650	400
	43	29700	Laredo, TX CFS Area	400	250
		99999	Remainder of Texas	12,000	2,600
UT	4	482	Salt Lake City-Provo-Orem, UT CFS Area	6,500	1,400
		99999	Remainder of Utah	1,500	600
VA	79	545	Virginia Beach-Norfolk, VA-NC CFS Area (VA Part)	2,300	800
	78	40060	Richmond, VA CFS Area	2,500	800
	77	47900	Washington-Arlington-Alexandria, DC-VA-MD-WV CFS Area (VA Part)	3,400	1,000
		99999	Remainder of Virginia	4,500	1,100
VT		99999	Remainder of Vermont	2,000	650
WA	2	440	Portland-Vancouver-Salem, OR-WA CFS Area (WA Part)	1,300	550
	1	500	Seattle-Tacoma, WA CFS Area	10,500	2,200
		99999	Remainder of Washington	4,800	1,100
WI	18	376	Milwaukee-Racine-Waukesha, WI CFS Area	5,800	1,300
		99999	Remainder of Wisconsin	10,000	2,000
WV		99999	Remainder of West Virginia	2,700	900
WY		99999	Remainder of Wyoming	1,700	700

Note: The U.S. Census Bureau has reviewed this table to ensure appropriate access, use, and disclosure avoidance protection of the confidential source data (Project number: 7504609 and Disclosure Review Board (DRB) approval number: CBDRB-FY25-ESMD002-015).
Source: U.S. Census Bureau, 2025.