

# 2012 Commodity Flow Survey (CFS) Public Use Microdata (PUM) File Data Users Guide

## *Technical Documentation*

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### **1. Introduction**

This document describes the Public Use Microdata (PUM) File created for the 2012 Commodity Flow Survey (CFS). This user guide provides a brief description of the CFS and the differences between the CFS data used to create the published estimates and the records available in the PUM file. This document also explains how to create estimates and measures of sampling variability from the PUM file data. For a complete description of the CFS and access to the published tables, visit the CFS website at: [www.census.gov/econ/cfs/](http://www.census.gov/econ/cfs/). This is an experimental data product and comments from users regarding the content and usefulness of this product are appreciated. Contact the CFS staff by e-mail (ERD.CFS@census.gov) or phone (301-763-2108) with your comments.

### **2. CFS Background**

The Commodity Flow Survey (CFS) is a joint effort by the Bureau of Transportation Statistics (BTS) and the U.S. Census Bureau, U.S. Department of Commerce. The survey is the primary source of national and state-level data on domestic freight shipments by establishments in mining, manufacturing, wholesale, auxiliaries, and selected retail and services trade industries located in the 50 states and the District of Columbia. The survey produces estimates on the type, origin and destination, value, weight, modes of transportation, distance shipped, and ton-miles of commodities shipped. The CFS is conducted every five years as part of the Economic Census. It provides a modal picture of national freight flows, and represents the only publicly available source of commodity flow data for the highway mode. The CFS was conducted in 1993, 1997, 2002, 2007 and most recently in 2012.

For special tabulations of the CFS data that cannot be computed using this PUM file, contact the CFS staff by e-mail (ERD.CFS@census.gov) or phone (301-763-2108) to discuss cost estimates and exact specifications for the type and format of the data requested.

### **3. PUM File Contents**

The PUM file includes 20 variables for all usable shipment records collected by the CFS – a total of 4,547,661 shipments from approximately 60,000 responding establishments. The information included on each shipment record is:

- Shipment Origin
  - State
  - Metropolitan Area
- Shipment Destination (in US)
  - State
  - Metropolitan Area
- NAICS industry classification of the shipper
- Quarter in 2012 in which the shipment was made

- Type of commodity
- Mode of transportation
- The value of the shipment (dollars)
- The weight of the shipment (pounds)
- The great circle distance between the shipment origin and US destination (in miles)
- The routed distance between the shipment origin and US destination (in miles)<sup>1</sup>
- Whether or not the shipment required temperature control during transportation
- Whether or not the shipment was an export
- If an export, the final export destination country
- Hazardous material code
- Shipment tabulation weighting factor – used to expand PUM file (numeric) shipment data to represent the total population of in-scope U.S. shipments in 2012. This shipment tabulation weighting factor is the product of seven different component weights and disclosure avoidance noise factors. The 2012 CFS Survey Methodology at [www.census.gov/econ/cfs/2012\\_methodology.html](http://www.census.gov/econ/cfs/2012_methodology.html) describes how the component weights were calculated. For this PUM file, further adjustments were made to the weighting factor and are described in section 4 below.

*Note: The shipment tabulating weighting factor (WGT\_FACTOR) assigned to a shipment is also an estimate of the number of shipments of the type represented by that PUM file shipment record<sup>2</sup>. Summing the tabulation weighting factors of all PUM file shipments going from, say, Ohio to Texas will produce an estimate of the U.S. total number of shipments travelling that route. However, the survey respondent determines what constitutes a shipment - there are no weight, value, volume, or other limits on the size of a shipment. The only requirement is that it must have a single destination and require one trip. Single shipments may have multiple pieces or go by multiple vehicles, such as unit trains or truck convoys, but only one destination. See the 2012 CFS instruction guide at [www.census.gov/econ/cfs/get\\_forms.html](http://www.census.gov/econ/cfs/get_forms.html) for more information on the guidance given to CFS respondents.*

The complete layout and description of the variables of the PUM file is provided in Appendix A.

#### **4. Differences Between Published CFS Estimates and PUM File Tabulations**

To protect the confidentiality of CFS respondents, the CFS uses noise-infusion when producing estimates of shipment value and shipment weight. Details relating to this disclosure avoidance technique may be found on the CFS website at [www.census.gov/econ/cfs/2012\\_methodology.html](http://www.census.gov/econ/cfs/2012_methodology.html) along with information on the survey coverage, sampling, mileage calculation, and estimation methodologies.

For this PUM file, additional measures were taken to protect the confidentiality of the data of the CFS respondents. While implementing these measures, certain desirable properties in the original data were maintained to the extent possible. These were:

- Estimates produced from the PUM file would be close to the published ones.
- The value to weight ratio of individual shipments was maintained.

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<sup>1</sup> Note that multiple shipments traveling together on the same vehicle (truck, airplane, etc.) will each have an origin-to-destination distance assigned to them even though the carrier travels that distance only once.

<sup>2</sup> Note: A small number of shipments have weighting factors < 1.

- When the level of detail provided had to be reduced, mode and commodity detail were reduced before geographic detail.

The additional measures to protect confidentiality were:

- Additional noise was applied to the shipment value and weight.
- Extremely large shipment values and weights were top-coded.
- Extremely large shipment weighting factors were truncated to 975,000.

*Note: In the three cases above, adjustments were also made to other variables so that the product of shipment value (or shipment weight) and the weighting factor for each shipment after these changes is approximately equal to the same product before the changes.*

- Shipment value, weight and distance quantities were rounded to the nearest integer. Weighting factors were rounded to the nearest tenth.
- For approximately 14,000 shipments, the detail provided for the origin, commodity, and/or mode of transportation was reduced or collapsed. For example, a shipment origin might have been changed from the Chicago, IL CFS Area to just Illinois.

Tables of U.S.-level estimates by origin state, commodity, and mode comparing published CFS data to tabulations created using the PUM file are shown in Appendix B.

Estimates produced using the 2012 CFS PUM file have the same issues with comparability to prior surveys as the published 2012 estimates. Data users should be cautious when comparing any 2012 estimates with 2007 or earlier CFS estimates. See the Comparability of Estimates section of the 2012 CFS Survey Methodology at [www.census.gov/econ/cfs/2012\\_methodology.html](http://www.census.gov/econ/cfs/2012_methodology.html) for a discussion of these comparability issues.

## 5. How to Estimate Totals and Average Miles Per Shipment with the PUM File

### a. Total value, total tonnage, and total ton-miles

**Important note:** To make estimates of total value, one must multiply the value of the shipment (*SHIPMT\_VALUE*) by the shipment tabulation weighting factor (*WGT\_FACTOR*), before summing. This same rule applies to making estimates of total tonnage and total ton-miles. The formulas showing this method are given below.

An estimate of the total value (in dollars) for a given domain is given by

$$\text{Total value for a given domain} = \sum_{i=1}^n (WGT\_FACTOR_i \times SHIPMT\_VALUE_i),$$

where *WGT\_FACTOR* is the shipment tabulation weighting factor, *SHIPMT\_VALUE* is the value of the shipment, *i* indexes the shipments in the given domain, and *n* is the number of shipments in the given domain.

For example, if we want to estimate the total value of shipments originating in Maryland, then we compute the quantity above using shipments where *ORIG\_STATE* = 24. **Note that by domain, we do not only mean a geographical domain. For example, if we want to estimate**

**the total value of shipments of basic chemicals, then we compute the quantity above using shipments where SCTG = 20.**

Estimates of the total tonnage and total ton-miles can be made analogously. An estimate of the total tonnage for a given domain is given by

$$\text{Total tonnage for a given domain} = \sum_{i=1}^n [WGT\_FACTOR_i \times (SHIPMT\_WGHT_i/2000)],$$

where  $WGT\_FACTOR$  is the shipment tabulation weighting factor,  $SHIPMT\_WGHT$  is the weight of the shipment,  $i$  indexes the shipments in the given domain, and  $n$  is the number of shipments in the given domain. (We divide  $SHIPMT\_WGHT$  by 2000 since  $SHIPMT\_WGHT$  is in pounds.)

An estimate of the total ton-miles for a given domain is given by

*Total ton-miles for a given domain =*

$$\sum_{i=1}^n [WGT\_FACTOR_i \times (SHIPMT\_WGHT_i/2000) \times SHIPMT\_DIST\_ROUTED_i],$$

where  $WGT\_FACTOR$  is the shipment tabulation weighting factor,  $SHIPMT\_WGHT$  is the weight of the shipment,  $SHIPMT\_DIST\_ROUTED$  is the routed distance between the shipment origin and destination,  $i$  indexes the shipments in the given domain, and  $n$  is the number of shipments in the given domain. (We divide  $SHIPMT\_WGHT$  by 2000 since  $SHIPMT\_WGHT$  is in pounds.)

**b. Average miles per shipment**

**Important note:** Similar to the important note above for estimates of total value, total tonnage, and total ton-miles, one must use the shipment tabulation weighting factor ( $WGT\_FACTOR$ ) in making estimates of average miles per shipment, as given by the formula below.

An estimate of the average miles per shipment for a given domain is given by

*Average miles per shipment for a given domain =*

$$\frac{\sum_{i=1}^n (WGT\_FACTOR_i \times SHIPMT\_DIST\_ROUTED_i)}{\sum_{i=1}^n WGT\_FACTOR_i},$$

where  $WGT\_FACTOR$  is the shipment tabulation weighting factor,  $SHIPMT\_DIST\_ROUTED$  is the routed distance between the shipment origin and destination,  $i$  indexes the shipments in the given domain, and  $n$  is the number of shipments in the given domain.

*Note: The tables in Appendix B (in the columns under "PUM File Tabulations – Weighted") contain estimates for Modes, Commodities, and Origin States produced using these formulas.*

## 6. How to Estimate Coefficients of Variation (CVs) with the PUM File

### a. Motivation and basic idea of the generalized variance function (GVF) method

We developed a generalized variance function (GVF) method to allow users to compute coefficients of variation (CVs) of estimates made with the PUM file. This is necessary because, due to confidentiality concerns, we are not able to place the information on the PUM file that would allow users to compute CVs by the random groups method. (The random groups method is used to compute the CVs of the estimates that are released to the public.)

The basic idea of the GVF method is to find a function (which is called the GVF) that expresses the CVs in terms of quantities that can be computed with the PUM file and unknown parameters. This function is then incorporated into a linear regression model, in which the CV computed by the random groups method is the outcome variable, the quantities that can be computed with the PUM file are the covariates, and the unknown parameters are regression coefficients. The regression coefficients are estimated by the Census Bureau, and supplied to the users. Then, with the quantities that can be computed with the PUM file, and with the estimates of the regression coefficients, users can compute CVs.

### b. Computing CVs for total value, total tonnage, and total ton-miles

For estimates of total value, total tonnage, and total ton-miles, the GVF is

$$\ln(CV_{total}) = a + b \ln(n) + c (\ln(n))^2,$$

where  $\ln$  is the natural log (i.e., log to the base  $e$ ),  $CV_{total}$  is the CV (expressed as a percent) of the estimate of the total,  $n$  is the number of shipments that were used to compute the estimate, and  $a$ ,  $b$ , and  $c$  are regression coefficients found in table 1 below.

Therefore, in order to compute the CV of an estimate of a total, compute:

$$CV_{total} = e^{a+b \ln(n)+c (\ln(n))^2}.$$

**Note: Choose  $a$ ,  $b$ , and  $c$  from Table 1 below, depending on which type of total is being estimated.**

### c. Example of computing the CV of an estimate of total value

Suppose we want to compute the CV of the estimate of the total value of shipments originating in Maryland. The number of shipments originating in Maryland is 71,425, and we need to choose  $a$ ,  $b$ , and  $c$  from the first row of Table 1 below. So the CV is:

$$CV_{total} = e^{3.844+0.039\ln(71,425)-0.020 (\ln(71,425))^2} = 5.94\%.$$

### d. Computing CVs for average miles per shipment (AMPS)

For estimates of average miles per shipment, the GVF is

$$\ln(CV_{average \ miles \ per \ shipment}) = a + b \ln(n) + c \ln(AMPS),$$

where  $\ln$  is the natural log (i.e., log to the base  $e$ ),  $CV_{average \ miles \ per \ shipment}$  is the CV (expressed as a percent) of the estimate of average miles per shipment,  $n$  is the number of shipments that were used to compute the estimate,  $AMPS$  is the estimate of average miles per shipment, and  $a$ ,  $b$ , and  $c$  are regression coefficients.

Therefore, in order to compute the CV of the estimate of average miles per shipment, compute:

$$CV_{total} = e^{a+b \ln(n)+c \ln(AMPS)} .$$

**Note: Choose  $a$ ,  $b$ , and  $c$  from the last row of Table 1 below.**

**Table 1: Regression Coefficients of the GVFs**

Estimate	$a$	$b$	$c$
Total value	3.844	0.039	-0.020
Total tonnage	3.761	0.076	-0.019
Total ton-miles	4.092	-0.015	-0.012
Average miles per shipment	5.168	-0.084	-0.376

Note: The tables in Appendix C (in the columns under “PUM File GVF CVs”) contain CVs produced using these formulas for the estimates in the tables in Appendix B.

## 2012 CFS PUM File Data Dictionary

Field	Description	Valid Values	Type	Length
SHIPMT_ID	Shipment identifier	0000001 – 4547661	CHAR	7
ORIG_STATE	FIPS state code of shipment origin	01 - 56	CHAR	2
ORIG_MA	Metro area of shipment origin	See Note (1)	CHAR	5
ORIG_CFS_AREA	CFS Area of shipment origin	Concatenation of ORIG_STATE and ORIG_MA (ex: 24-12580)	CHAR	8
DEST_STATE	FIPS state code of shipment destination	01-56	CHAR	2
DEST_MA	Metro area of shipment destination	See Note (1)	CHAR	5
DEST_CFS_AREA	CFS Area of shipment destination	Concatenation of DEST_STATE and DEST_MA (ex: 01-142)	CHAR	8
NAICS	Industry classification of shipper	See Note (2)	CHAR	6
QUARTER	Quarter of 2012 in which the shipment occurred	1, 2, 3, 4	CHAR	1
SCTG	2-digit SCTG commodity code of the shipment	See Note (3)	CHAR	5
MODE	Mode of transportation of the shipment	See Note (4)	CHAR	3
SHIPMT_VALUE	Value of the shipment in dollars	0 - 999,999,999	NUM	
SHIPMT_WGHT	Weight of the shipment in pounds	0 - 999,999,999	NUM	
SHIPMT_DIST_GC	Great circle distance between shipment origin and destination (in miles)	0 - 99,999	NUM	
SHIPMT_DIST_ROUTED	Routed distance between shipment origin and destination (in miles)	0 - 99,999	NUM	
TEMP_CNTL_YN	Temperature controlled shipment - Yes or No	Y, N	CHAR	1
EXPORT_YN	Export shipment - Yes or No	Y, N	CHAR	1
EXPORT_CNTRY	Export final destination	C = Canada M = Mexico O = Other country N = Not an export	CHAR	1
HAZMAT	Hazardous material (HAZMAT) code	P = Class 3.0 Hazmat (flammable liquids) H = Other Hazmat N = Not Hazmat	CHAR	1
WGT_FACTOR	Shipment tabulation weighting factor. (This factor is also an estimate of the total number of shipments represented by the PUM file shipment.)	0 – 975,000.0	NUM	

## Notes:

- (1) See Appendix A-1 for the descriptions of the 132 valid CFS areas
- (2) See Appendix A-2 for the descriptions of the 45 valid NAICS codes
- (3) See Appendix A-3 for the descriptions of the 43 valid SCTG commodity codes
- (4) See Appendix A-4 for the descriptions of the 20 valid Mode codes

## CFS Areas

ORIG_MA DEST_MA	ORIG_STATE DEST_STATE	ORIG_CFS_AREA DEST_CFS_AREA	MA Type	Description
104	36	36-104	C	Albany-Schenectady, NY CFS Area
122	13	13-122	C	Atlanta-Athens-Clarke County-Sandy Springs, GA CFS Area
142	01	01-142	C	Birmingham-Hoover-Talladega, AL CFS Area
148	25	25-148	C	Boston-Worcester-Providence, MA-RI-NH-CT CFS Area (MA Part)
	33	33-148	C	Boston-Worcester-Providence, MA-RI-NH-CT CFS Area (NH Part)
	44	44-148	C	Boston-Worcester-Providence, MA-RI-NH-CT CFS Area (RI Part)
160	36	36-160	C	Buffalo-Cheektowaga, NY CFS Area
172	37	37-172	C	Charlotte-Concord, NC-SC CFS Area (NC Part)
176	17	17-176	C	Chicago-Naperville, IL-IN-WI CFS Area (IL Part)
	18	18-176	C	Chicago-Naperville, IL-IN-WI CFS Area (IN Part)
178	21	21-178	C	Cincinnati-Wilmington-Maysville, OH-KY-IN CFS Area (KY Part)
	39	39-178	C	Cincinnati-Wilmington-Maysville, OH-KY-IN CFS Area (OH Part)
184	39	39-184	C	Cleveland-Akron-Canton, OH CFS Area
198	39	39-198	C	Columbus-Marion-Zanesville, OH CFS Area
204	48	48-204	C	Corpus Christi-Kingsville-Alice, TX CFS Area
206	48	48-206	C	Dallas-Fort Worth, TX-OK CFS Area (TX Part)
212	39	39-212	C	Dayton-Springfield-Sidney, OH CFS Area
216	08	08-216	C	Denver-Aurora, CO CFS Area
220	26	26-220	C	Detroit-Warren-Ann Arbor, MI CFS Area
238	48	48-238	C	El Paso-Las Cruces, TX-NM CFS Area (TX Part)
258	18	18-258	C	Fort Wayne-Huntington-Auburn, IN CFS Area
260	06	06-260	C	Fresno-Madera, CA CFS Area
266	26	26-266	C	Grand Rapids-Wyoming-Muskegon, MI CFS Area
268	37	37-268	C	Greensboro--Winston-Salem--High Point, NC CFS Area
273	45	45-273	C	Greenville-Spartanburg-Anderson, SC CFS Area
288	48	48-288	C	Houston-The Woodlands, TX CFS Area
294	18	18-294	C	Indianapolis-Carmel-Muncie, IN CFS Area
300	12	12-300	C	Jacksonville-St. Marys-Palatka, FL-GA CFS Area (FL Part)
312	20	20-312	C	Kansas City-Overland Park-Kansas City, MO-KS CFS Area (KS Part)
	29	29-312	C	Kansas City-Overland Park-Kansas City, MO-KS CFS Area (MO Part)
314	47	47-314	C	Knoxville-Morristown-Sevierville, TN CFS Area
332	32	32-332	C	Las Vegas-Henderson, NV-AZ CFS Area (NV Part)
348	06	06-348	C	Los Angeles-Long Beach, CA CFS Area
350	21	21-350	C	Louisville/Jefferson County-Elizabethtown-Madison, KY-IN CFS Area (KY Part)
368	47	47-368	C	Memphis, TN-MS-AR CFS Area (TN Part)
370	12	12-370	C	Miami-Fort Lauderdale-Port St. Lucie, FL CFS Area
376	55	55-376	C	Milwaukee-Racine-Waukesha, WI CFS Area
378	27	27-378	C	Minneapolis-St. Paul, MN-WI CFS Area (MN Part)
380	01	01-380	C	Mobile-Daphne-Fairhope, AL CFS Area
400	47	47-400	C	Nashville-Davidson--Murfreesboro, TN CFS Area
406	22	22-406	C	New Orleans-Metairie-Hammond, LA-MS CFS Area (LA Part)
408	09	09-408	C	New York-Newark, NY-NJ-CT-PA CFS Area (CT Part)
	34	34-408	C	New York-Newark, NY-NJ-CT-PA CFS Area (NJ Part)
	36	36-408	C	New York-Newark, NY-NJ-CT-PA CFS Area (NY Part)
	42	42-408	C	New York-Newark, NY-NJ-CT-PA CFS Area (PA Part)
416	40	40-416	C	Oklahoma City-Shawnee, OK CFS Area

<b>ORIG_MA DEST_MA</b>	<b>ORIG_STATE DEST_STATE</b>	<b>ORIG_CFS_AREA DEST_CFS_AREA</b>	<b>MA Type</b>	<b>Description</b>
420	31	31-420	C	Omaha-Council Bluffs-Fremont, NE-IA CFS Area (NE Part)
422	12	12-422	C	Orlando-Deltona-Daytona Beach, FL CFS Area
428	10	10-428	C	Philadelphia-Reading-Camden, PA-NJ-DE-MD CFS Area (DE Part)
	34	34-428	C	Philadelphia-Reading-Camden, PA-NJ-DE-MD CFS Area (NJ Part)
	42	42-428	C	Philadelphia-Reading-Camden, PA-NJ-DE-MD CFS Area (PA Part)
430	42	42-430	C	Pittsburgh-New Castle-Weirton, PA-OH-WV CFS Area (PA Part)
440	41	41-440	C	Portland-Vancouver-Salem, OR-WA CFS Area (OR Part)
	53	53-440	C	Portland-Vancouver-Salem, OR-WA CFS Area (WA Part)
450	37	37-450	C	Raleigh-Durham-Chapel Hill, NC CFS Area
464	36	36-464	C	Rochester-Batavia-Seneca Falls, NY CFS Area
472	06	06-472	C	Sacramento-Roseville, CA CFS Area
476	17	17-476	C	St. Louis-St. Charles-Farmington, MO-IL CFS Area (IL Part)
	29	29-476	C	St. Louis-St. Charles-Farmington, MO-IL CFS Area (MO Part)
482	49	49-482	C	Salt Lake City-Provo-Orem, UT CFS Area
488	06	06-488	C	San Jose-San Francisco-Oakland, CA CFS Area
496	13	13-496	C	Savannah-Hinesville-Statesboro, GA CFS Area
500	53	53-500	C	Seattle-Tacoma, WA CFS Area
536	04	04-536	C	Tucson-Nogales, AZ CFS Area
538	40	40-538	C	Tulsa-Muskogee-Bartlesville, OK CFS Area
545	51	51-545	C	Virginia Beach-Norfolk, VA-NC CFS Area (VA Part)
556	20	20-556	C	Wichita-Arkansas City-Winfield, KS CFS Area
12420	48	48-12420	M	Austin-Round Rock, TX CFS Area
12580	24	24-12580	M	Baltimore-Columbia-Towson, MD CFS Area
12940	22	22-12940	M	Baton Rouge, LA CFS Area
13140	48	48-13140	M	Beaumont-Port Arthur, TX CFS Area
16700	45	45-16700	M	Charleston-North Charleston-Summerville, SC CFS Area
25540	09	09-25540	M	Hartford-West Hartford-East Hartford, CT CFS Area
29340	22	22-29340	M	Lake Charles, LA CFS Area
29700	48	48-29700	M	Laredo, TX CFS Area
38060	04	04-38060	M	Phoenix-Mesa-Glendale, AZ CFS Area
40060	51	51-40060	M	Richmond, VA CFS Area
41700	48	48-41700	M	San Antonio-New Braunfels, TX CFS Area
41740	06	06-41740	M	San Diego-Carlsbad-San Marcos, CA CFS Area
45300	12	12-45300	M	Tampa-St. Petersburg-Clearwater, FL CFS Area
46520	15	15-46520	M	Urban Honolulu, HI CFS Area
47900	11	11-47900	M	Washington-Arlington-Alexandria, DC-VA-MD-WV CFS Area (DC Part)
	24	24-47900	M	Washington-Arlington-Alexandria, DC-VA-MD-WV CFS Area (MD Part)
	51	51-47900	M	Washington-Arlington-Alexandria, DC-VA-MD-WV CFS Area (VA Part)
99999	01	01-99999	R	Remainder of Alabama CFS Area
99999	02	02-99999	R	Remainder of Alaska CFS Area
99999	04	04-99999	R	Remainder of Arizona CFS Area
99999	05	05-99999	R	Remainder of Arkansas CFS Area
99999	06	06-99999	R	Remainder of California CFS Area
99999	08	08-99999	R	Remainder of Colorado CFS Area
99999	09	09-99999	R	Remainder of Connecticut CFS Area
99999	10	10-99999	R	Remainder of Delaware CFS Area
99999	12	12-99999	R	Remainder of Florida CFS Area
99999	13	13-99999	R	Remainder of Georgia CFS Area

ORIG_MA DEST_MA	ORIG_STATE DEST_STATE	ORIG_CFS_AREA DEST_CFS_AREA	MA Type	Description
99999	15	15-99999	R	Remainder of Hawaii CFS Area
99999	16	16-99999	R	Remainder of Idaho CFS Area
99999	17	17-99999	R	Remainder of Illinois CFS Area
99999	18	18-99999	R	Remainder of Indiana CFS Area
99999	19	19-99999	R	Remainder of Iowa CFS Area
99999	20	20-99999	R	Remainder of Kansas CFS Area
99999	21	21-99999	R	Remainder of Kentucky CFS Area
99999	22	22-99999	R	Remainder of Louisiana CFS Area
99999	23	23-99999	R	Remainder of Maine CFS Area
99999	24	24-99999	R	Remainder of Maryland CFS Area
99999	25	25-99999	R	Remainder of Massachusetts CFS Area
99999	26	26-99999	R	Remainder of Michigan CFS Area
99999	27	27-99999	R	Remainder of Minnesota CFS Area
99999	28	28-99999	R	Remainder of Mississippi CFS Area
99999	29	29-99999	R	Remainder of Missouri CFS Area
99999	30	30-99999	R	Remainder of Montana CFS Area
99999	31	31-99999	R	Remainder of Nebraska CFS Area
99999	32	32-99999	R	Remainder of Nevada CFS Area
99999	33	33-99999	R	Remainder of New Hampshire CFS Area
99999	35	35-99999	R	Remainder of New Mexico CFS Area
99999	36	36-99999	R	Remainder of New York CFS Area
99999	37	37-99999	R	Remainder of North Carolina CFS Area
99999	38	38-99999	R	Remainder of North Dakota CFS Area
99999	39	39-99999	R	Remainder of Ohio CFS Area
99999	40	40-99999	R	Remainder of Oklahoma CFS Area
99999	41	41-99999	R	Remainder of Oregon CFS Area
99999	42	42-99999	R	Remainder of Pennsylvania CFS Area
99999	45	45-99999	R	Remainder of South Carolina CFS Area
99999	46	46-99999	R	Remainder of South Dakota CFS Area
99999	47	47-99999	R	Remainder of Tennessee CFS Area
99999	48	48-99999	R	Remainder of Texas CFS Area
99999	49	49-99999	R	Remainder of Utah CFS Area
99999	50	50-99999	R	Remainder of Vermont CFS Area
99999	51	51-99999	R	Remainder of Virginia CFS Area
99999	53	53-99999	R	Remainder of Washington CFS Area
99999	54	54-99999	R	Remainder of West Virginia CFS Area
99999	55	55-99999	R	Remainder of Wisconsin CFS Area
99999	56	56-99999	R	Remainder of Wyoming CFS Area
<b>The following codes only apply to shipment origin variables</b>				
00000	NN	NN-00000	R	Origin metro area suppressed (where NN is a valid ORIG_STATE code)
00000	00	00-00000	R	Origin state and metro area suppressed

MA Type: C = Combined statistical area (CSA) type CFS Area, M = Metropolitan statistical area (MSA) type CFS Area, R = Remainder of state type CFS Area

NOTE: For some shipments, it was necessary to suppress the CFS area of the shipment origin while still providing the state. For example, if a shipment originating in the Chicago CFS Area (IL part) had to be (partially) suppressed, the ORIG\_MA would be set to 00000 and the origin CFS Area would be 17-00000 (somewhere in IL).

**NAICS (North American Industry Classification System) Codes**

NAICS	Description
212	Mining (except oil and gas)
311	Food manufacturing
312	Beverage and tobacco product manufacturing
313	Textile mills
314	Textile product mills
315	Apparel manufacturing
316	Leather and allied product manufacturing
321	Wood product manufacturing
322	Paper manufacturing
323	Printing and related support activities
324	Petroleum and coal products manufacturing
325	Chemical manufacturing
326	Plastics and rubber products manufacturing
327	Nonmetallic mineral product manufacturing
331	Primary metal manufacturing
332	Fabricated metal product manufacturing
333	Machinery manufacturing
334	Computer and electronic product manufacturing
335	Electrical equipment, appliance, and component manufacturing
336	Transportation equipment manufacturing
337	Furniture and related product manufacturing
339	Miscellaneous manufacturing
4231	Motor vehicle and parts merchant wholesalers
4232	Furniture and home furnishing merchant wholesalers
4233	Lumber and other construction materials merchant wholesalers
4234	Commercial equip. merchant wholesalers
4235	Metal and mineral (except petroleum) merchant wholesalers
4236	Electrical and electronic goods merchant wholesalers
4237	Hardware and plumbing merchant wholesalers
4238	Machinery, equipment, and supplies merchant wholesalers
4239	Miscellaneous durable goods merchant wholesalers
4241	Paper and paper product merchant wholesalers
4242	Drugs and druggists' sundries merchant wholesalers
4243	Apparel, piece goods, and notions merchant wholesalers
4244	Grocery and related product merchant wholesalers
4245	Farm product raw material merchant wholesalers
4246	Chemical and allied products merchant wholesalers
4247	Petroleum and petroleum products merchant wholesalers
4248	Beer, wine, and distilled alcoholic beverage merchant wholesalers
4249	Miscellaneous nondurable goods merchant wholesalers
4541	Electronic shopping and mail-order houses
45431	Direct selling establishments
4931	Warehousing and storage (includes 484)
5111	Newspaper, periodical, book, and directory publishers
551114	Corporate, subsidiary, and regional managing offices

**SCTG (Standard Classification of Transported Goods) Codes**

<b>SCTG</b>	<b>Description</b>	<b>SCTG Group</b>
01	Animals and Fish (live)	01-05
02	Cereal Grains (includes seed)	
03	Agricultural Products (excludes Animal Feed, Cereal Grains, and Forage Products)	
04	Animal Feed, Eggs, Honey, and Other Products of Animal Origin	
05	Meat, Poultry, Fish, Seafood, and Their Preparations	
06	Milled Grain Products and Preparations, and Bakery Products	06-09
07	Other Prepared Foodstuffs, and Fats and Oils	
08	Alcoholic Beverages and Denatured Alcohol	
09	Tobacco Products	
10	Monumental or Building Stone	10-14
11	Natural Sands	
12	Gravel and Crushed Stone (excludes Dolomite and Slate)	
13	Other Non-Metallic Minerals not elsewhere classified	
14	Metallic Ores and Concentrates	
15	Coal	15-19
16	Crude Petroleum	
17	Gasoline, Aviation Turbine Fuel, and Ethanol (includes Kerosene, and Fuel Alcohols)	
18	Fuel Oils (includes Diesel, Bunker C, and Biodiesel)	
19	Other Coal and Petroleum Products, not elsewhere classified	
20	Basic Chemicals	20-24
21	Pharmaceutical Products	
22	Fertilizers	
23	Other Chemical Products and Preparations	
24	Plastics and Rubber	
25	Logs and Other Wood in the Rough	25-30
26	Wood Products	
27	Pulp, Newsprint, Paper, and Paperboard	
28	Paper or Paperboard Articles	
29	Printed Products	
30	Textiles, Leather, and Articles of Textiles or Leather	
31	Non-Metallic Mineral Products	31-34
32	Base Metal in Primary or Semi-Finished Forms and in Finished Basic Shapes	
33	Articles of Base Metal	
34	Machinery	
35	Electronic and Other Electrical Equipment and Components, and Office Equipment	35-38
36	Motorized and Other Vehicles (includes parts)	
37	Transportation Equipment, not elsewhere classified	
38	Precision Instruments and Apparatus	
39	Furniture, Mattresses and Mattress Supports, Lamps, Lighting Fittings, and Illuminated Signs	39-99
40	Miscellaneous Manufactured Products	
41	Waste and Scrap (excludes of agriculture or food, see 041xx)	
43	Mixed Freight	
99	Missing Code	
00	Commodity code suppressed	

NOTE: For some shipments the 2-digit SCTG was replaced with the SCTG Group (for example, SCTG = "35-38") or suppressed completely (SCTG = "00")

## Mode of Transportation Codes

Mode Code	Mode of transportation Description
02	<i>Single mode</i>
03	<i>Truck</i>
<b>04</b>	<b>For-hire truck</b>
<b>05</b>	<b>Private truck</b>
<b>06</b>	<b>Rail</b>
07	<i>Water</i>
<b>08</b>	<b>Inland Water</b>
<b>09</b>	<b>Great Lakes</b>
<b>10</b>	<b>Deep Sea</b>
<b>101</b>	<b>Multiple Waterways</b>
<b>11</b>	<b>Air (incl truck &amp; air)</b>
<b>12</b>	<b>Pipeline</b>
<b>19</b>	<b>Other mode</b>
13	<i>Multiple mode</i>
<b>14</b>	<b>Parcel, USPS, or courier</b>
20	<i>Non-parcel multiple mode</i>
<b>15</b>	<b>Truck and rail</b>
<b>16</b>	<b>Truck and water</b>
<b>17</b>	<b>Rail and water</b>
<b>18</b>	<b>Other multiple mode</b>
00	<i>Mode suppressed</i>

NOTE: The vast majority of shipments in the PUM File are assigned the most detailed mode code listed in the table to the left (in **bold**). However, for some shipments, it was necessary to recode the Mode to a less detailed code. For example, the Mode of a shipment would be recoded from Great Lakes (09) to the less detailed code, Water (07) or even less detailed, Single Mode (02). In very rare circumstances, the Mode of a shipment was suppressed entirely (00).

The table below shows the sequential collapsing pattern used when it was not possible to retain the most detailed Mode code. Mode 20, Non-parcel multiple mode, is not a Mode level included in the published CFS tables.

## Mode Collapsing Pattern

Most Detailed Mode Codes		1st Collapsing		2nd Collapsing		3rd Collapsing	
04	For-hire truck	03	Truck	02	Single mode	00	Mode suppressed
05	Private truck						
06	Rail						
08	Inland Water	07	Water				
09	Great Lakes						
10	Deep Sea						
101	Multiple Waterways						
11	Air (incl truck & air)						
12	Pipeline						
19	Other mode						
14	Parcel, USPS, or courier			13	Multiple mode		
15	Truck and rail	20	Non-parcel multiple mode				
16	Truck and water						
17	Rail and water						
18	Other multiple mode						

Comparison of Published Estimates and Estimates Produced from the PUM File  
for Selected Shipment Characteristics

**Table B1: Comparison with Weighted PUM File Tabulations and Published CFS Estimates - Mode**

Mode	Number of PUM File Records	PUM File Tabulations - Weighted				Published Estimates			
		VALUE (\$)	WGHT (tons)	Ton-Miles	Avg miles/shipment	Shipment Value (\$)	Shipment Weight (tons)	Ton-Miles	Avg miles/shipment
Total	4,547,661	13,852,108,526,359	11,299,444,150	2,969,914,952,583	615	13,852,143,000,000	11,299,409,000	2,969,506,000,000	630
00	691	14,322,496,614	7,859,865	4,746,125,073	746				
02	7,506	245,607,201,503	350,219,872	100,396,893,301	1,174				
03	370	1,687,264,839	2,729,959	244,587,731	172				
04	1,613,317	6,497,910,010,005	4,291,260,910	1,050,198,094,647	512	6,504,636,000,000	4,298,693,000	1,050,942,000,000	508
05	1,618,282	3,624,027,342,318	3,754,398,071	195,034,905,054	48	3,627,592,000,000	3,761,472,000	196,775,000,000	58
06	38,458	430,203,248,147	1,536,294,576	1,161,931,350,251	801	473,070,000,000	1,628,537,000	1,211,481,000,000	805
07	104	21,019,015,349	26,123,867	9,162,386,250	265				
08	2,590	166,819,323,205	343,483,517	90,491,266,034	254	218,927,000,000	424,542,000	118,742,000,000	275
09	73	271,672,079	29,381,724	10,811,443,734	360	424,000,000	31,403,000	10,959,000,000	347
10	924	10,081,620,204	18,925,863	4,885,640,906	1,031	59,878,000,000	72,987,000	22,130,000,000	1,157
101	205	13,824,762,709	28,373,101	29,931,958,868	1,047	22,325,000,000	47,064,000	41,035,000,000	1,034
11	68,809	438,009,419,746	4,542,270	5,375,561,685	1,248	450,575,000,000	4,845,000	5,810,000,000	1,295
12	3,673	433,481,277,182	507,032,385	28,751,882,810	40	542,936,000,000	635,975,000	S	S
13	4,836	53,862,001,726	89,083,835	64,936,316,889	1,056				
14	1,165,297	1,687,585,477,676	28,514,066	22,703,981,694	893	1,688,242,000,000	28,490,000	22,716,000,000	922
15	19,070	189,271,047,776	166,900,182	142,578,570,932	1,017	224,833,000,000	213,814,000	169,524,000,000	988
16	2,498	14,256,664,796	30,068,943	21,796,152,574	1,248	29,035,000,000	56,720,000	48,568,000,000	1,562
17	200	2,341,002,974	34,267,693	15,066,420,136	520	7,976,000,000	55,570,000	29,170,000,000	1,073
18	99	328,117,748	2,414,386	1,665,926,556	690	668,000,000	2,452,000	1,853,000,000	S
19	102	706,063,281	30,823,911	251,025,390	4	1,026,000,000	36,844,000	256,000,000	S
20	557	6,493,496,482	16,745,156	8,954,462,069	1,608				

**Notes to PUM File Tabulations:**

**Number of PUM File Records:** (Unweighted) Number of PUM file shipment records tabulated to produce the estimates

**VALUE:** Summed, weighted shipment value (SHIPMT\_VALUE)

**WGHT:** Summed, weighted shipment weight (SHIPMT\_WGHT), divided by 2000 (to convert shipment weight to tons)

**Ton-miles:** Summed, weighted product of SHIPMT\_WGHT and SHIPMT\_DIST\_ROUTED divided by 2000 (to convert shipment weight to tons)

**Average miles/shipment:** Summed, weighted shipment distance (SHIPMT\_DIST\_ROUTED) divided by summed WGT\_FACTOR

**Table B2: Comparison with Weighted PUM File Tabulations and Published CFS Estimates - Commodity**

SCTG	Number of PUM File Records	PUM File Tabulations - Weighted				Published Estimates			
		VALUE (\$)	WGHT (tons)	Ton-Miles	Avg miles/shipment	Shipment Value (\$)	Shipment Weight (tons)	Ton-Miles	Avg miles/shipment
Total	4,547,661	13,852,108,526,359	11,299,444,150	2,969,914,952,583		13,852,143,000,000	11,299,409,000	2,969,506,000,000	630
00	691	14,322,496,614	7,859,865	4,746,125,073	746				
01-05	1,458	21,860,760,291	48,675,540	25,924,163,819	1,315				
01	2,239	5,673,602,358	2,018,111	1,365,243,278	564	6,390,000,000	2,237,000	1,475,000,000	565
02	24,965	123,265,607,380	455,371,823	174,156,490,618	194	130,140,000,000	479,064,000	184,888,000,000	202
03	54,265	187,320,120,242	200,451,272	97,442,455,165	500	197,793,000,000	218,995,000	107,383,000,000	505
04	45,617	115,858,634,154	232,367,813	54,461,071,751	543	118,666,000,000	238,507,000	59,660,000,000	706
05	62,355	300,819,491,089	89,477,306	43,438,581,938	180	302,153,000,000	90,090,000	43,798,000,000	184
06-09	1,267	10,149,251,348	13,899,527	10,757,660,647	761				
06	53,265	149,304,922,961	111,375,364	49,496,926,980	155	151,799,000,000	115,109,000	53,947,000,000	169
07	183,021	578,023,460,695	518,138,092	196,462,265,491	332	584,496,000,000	527,393,000	201,438,000,000	450
08	98,947	176,815,516,381	97,985,940	33,636,695,422	80	178,011,000,000	99,255,000	35,176,000,000	81
09	16,864	67,111,524,349	2,909,861	641,131,388	809	67,395,000,000	2,919,000	650,000,000	830
10-14	1,437	6,975,964,735	73,925,476	27,305,612,884	424				
10	5,883	3,955,547,261	10,554,565	1,483,929,442	136	4,221,000,000	11,366,000	1,605,000,000	135
11	29,142	7,684,316,914	433,523,067	37,561,986,769	50	7,806,000,000	438,136,000	38,847,000,000	51
12	94,363	17,072,811,825	1,496,438,733	73,229,513,215	29	17,519,000,000	1,538,494,000	82,244,000,000	30
13	16,795	12,931,750,412	141,103,577	33,068,082,048	230	13,646,000,000	144,500,000	35,384,000,000	253
14	4,211	23,619,838,809	71,186,686	33,444,826,142	414	29,072,000,000	94,801,000	48,181,000,000	397
15-19	856	182,823,850,360	236,184,973	53,480,901,902	405				
15	11,002	39,819,633,111	1,028,857,205	654,091,389,489	84	41,178,000,000	1,047,934,000	663,676,000,000	87
17	38,588	1,098,775,566,811	1,182,054,163	90,032,105,244	44	1,158,935,000,000	1,244,059,000	97,395,000,000	46
18	60,218	598,970,811,449	709,153,165	34,818,917,514	31	706,535,000,000	843,282,000	59,341,000,000	31
19	133,849	370,623,225,046	502,423,208	84,902,603,124	97	388,085,000,000	528,059,000	99,564,000,000	98
20-24	1,888	21,519,752,751	29,890,839	21,804,949,863	808				
20	96,474	307,679,812,825	329,039,436	133,944,452,048	663	316,754,000,000	342,969,000	143,230,000,000	662
21	85,890	811,981,528,486	16,078,859	7,569,899,432	587	814,703,000,000	16,197,000	7,798,000,000	656
22	24,300	78,602,292,533	180,061,973	51,682,843,204	123	84,213,000,000	193,918,000	61,745,000,000	142
23	141,016	348,224,161,924	104,370,177	45,611,045,935	615	351,146,000,000	105,660,000	46,991,000,000	667
24	288,078	546,824,190,105	182,008,905	99,600,155,938	622	549,130,000,000	182,918,000	100,600,000,000	696
25-30	1,854	5,762,033,401	6,478,960	6,270,197,782	1,580				
25	4,966	4,190,439,525	34,181,573	3,532,152,911	191	4,527,000,000	35,123,000	3,878,000,000	184
26	161,961	143,531,911,726	295,523,675	80,282,429,947	298	144,134,000,000	297,429,000	82,275,000,000	299
27	61,999	122,569,272,195	121,712,724	67,456,286,612	254	123,892,000,000	123,300,000	69,122,000,000	261
28	95,548	125,236,300,541	75,238,887	25,372,203,525	621	126,268,000,000	76,530,000	26,687,000,000	634
29	200,529	159,242,441,973	38,619,341	14,618,626,951	445	159,583,000,000	38,800,000	14,890,000,000	506
30	213,796	463,710,865,481	39,347,426	24,844,005,104	1,065	465,777,000,000	39,849,000	25,485,000,000	1,064
31-34	1,473	12,642,216,630	16,224,828	13,282,548,327	1,316				
31	178,753	178,931,013,476	785,491,077	88,684,956,141	387	180,504,000,000	793,046,000	93,581,000,000	414
32	187,159	452,130,765,462	296,799,711	103,078,459,559	319	457,280,000,000	304,658,000	109,923,000,000	320
33	237,139	350,409,518,579	99,872,947	41,195,686,806	534	352,135,000,000	100,754,000	41,985,000,000	530
34	265,539	748,517,516,662	73,773,716	35,625,793,405	447	753,095,000,000	74,650,000	36,968,000,000	438
35-38	919	27,767,540,985	2,065,903	1,989,155,737	991				
35	318,586	1,030,010,209,686	45,985,843	28,046,758,991	818	1,031,944,000,000	46,212,000	28,362,000,000	838
36	183,009	1,029,485,259,102	129,214,628	63,380,353,716	498	1,038,341,000,000	130,069,000	64,758,000,000	479
37	46,078	256,316,501,373	6,393,672	4,016,927,405	841	280,391,000,000	7,514,000	4,342,000,000	844
38	132,035	350,933,817,868	7,278,482	5,291,962,969	958	351,894,000,000	7,306,000	5,324,000,000	954
39-99	1,190	9,967,832,729	11,957,660	4,518,019,229	1,370				
39	86,920	160,202,601,806	27,456,317	13,375,462,310	925	160,790,000,000	27,573,000	13,621,000,000	837
40	264,089	514,448,835,706	73,358,191	30,449,713,414	1,044	517,067,000,000	74,128,000	31,204,000,000	1,042
41	41,610	101,377,026,500	231,063,360	63,993,640,158	174	107,002,000,000	241,232,000	66,654,000,000	183
43	283,551	1,375,985,500,687	373,509,786	74,379,766,331	426	1,377,371,000,000	374,071,000	75,269,000,000	413
99	14	128,661,053	509,921	67,819,493	133	360,000,000	1,303,000	162,000,000	112

**Table B3: Comparison with Weighted PUM File Tabulations and Published CFS Estimates - Origin State**

Origin State	Number of PUM File Records	PUM File Tabulations - Weighted				Published Estimates			
		VALUE (\$)	WGHT (tons)	Ton-Miles	Avg miles/shipment	Shipment Value (\$)	Shipment Weight (tons)	Ton-Miles	Avg miles/shipment
Total	4,547,661	13,852,108,526,359	11,299,444,150	2,969,914,952,583		13,852,143,000,000	11,299,409,000	2,969,506,000,000	630
00	38	143,294,040	41,253	68,130,454	792		0	0	
01	84,389	214,753,223,157	191,503,826	51,232,589,559	350	214,750,000,000	191,500,000	51,227,000,000	353
02	14,675	19,850,388,612	23,962,016	3,109,779,233	154	19,848,000,000	23,958,000	3,108,000,000	156
04	67,307	147,142,090,370	117,116,834	16,305,132,815	833	147,147,000,000	117,119,000	16,298,000,000	819
05	39,621	114,092,638,324	121,430,462	30,477,137,619	333	114,095,000,000	121,430,000	30,478,000,000	334
06	341,984	1,476,349,364,667	718,350,633	171,457,792,837	908	1,476,407,000,000	718,345,000	171,432,000,000	907
08	65,541	158,802,571,649	169,330,148	50,450,901,756	742	158,800,000,000	169,335,000	50,450,000,000	737
09	75,764	271,111,600,122	179,844,642	32,461,472,965	532	271,125,000,000	179,846,000	32,455,000,000	531
10	21,956	42,755,200,399	25,540,126	2,790,202,398	446	42,768,000,000	25,537,000	2,786,000,000	424
11	2,464	2,509,017,087	3,049,266	371,211,139	77	2,509,000,000	3,049,000	S	S
12	172,342	440,520,410,096	414,023,068	61,730,716,370	674	440,516,000,000	414,015,000	61,698,000,000	700
13	130,663	395,727,099,074	272,758,589	62,446,940,699	469	395,725,000,000	272,760,000	62,439,000,000	472
15	28,796	22,156,099,546	25,729,283	2,830,302,978	571	22,156,000,000	25,730,000	S	571
16	29,864	41,404,701,775	44,001,243	24,421,588,589	610	41,405,000,000	44,001,000	24,417,000,000	616
17	170,608	825,193,848,848	606,866,712	149,598,651,420	519	825,191,000,000	606,874,000	149,574,000,000	517
18	141,060	394,002,588,908	324,661,538	66,187,118,287	517	393,998,000,000	324,668,000	66,176,000,000	524
19	75,307	195,990,602,516	263,353,118	85,175,475,477	375	195,992,000,000	263,357,000	85,170,000,000	376
20	79,343	218,972,536,459	193,930,630	70,902,036,331	561	218,973,000,000	193,929,000	70,888,000,000	548
21	87,865	268,524,948,558	285,827,280	88,314,468,897	729	268,530,000,000	285,812,000	88,294,000,000	733
22	72,015	349,658,949,495	438,162,349	138,349,051,194	212	349,658,000,000	438,166,000	138,352,000,000	215
23	26,783	38,523,483,856	44,888,554	9,630,526,224	620	38,545,000,000	44,888,000	9,628,000,000	606
24	71,425	162,447,966,342	101,237,619	12,050,069,448	200	162,416,000,000	101,222,000	12,042,000,000	223
25	97,933	235,927,552,681	109,367,445	13,481,478,422	478	235,932,000,000	109,368,000	13,472,000,000	504
26	150,136	427,100,797,337	258,962,712	61,466,640,527	574	427,177,000,000	258,965,000	61,455,000,000	582
27	127,000	270,395,268,870	291,693,699	101,372,601,606	913	270,394,000,000	291,694,000	101,362,000,000	998
28	37,348	140,335,009,840	119,047,184	24,659,884,039	428	140,334,000,000	119,048,000	24,662,000,000	424
29	114,370	242,396,081,929	197,077,268	47,780,547,412	524	242,404,000,000	197,077,000	47,770,000,000	529
30	25,742	30,561,188,729	90,510,514	73,467,239,072	478	30,561,000,000	90,511,000	73,468,000,000	479
31	57,500	109,148,019,018	146,474,306	66,856,660,932	435	109,147,000,000	146,474,000	66,851,000,000	436
32	39,753	69,586,503,360	40,254,328	10,177,295,066	980	69,591,000,000	40,254,000	10,176,000,000	975
33	42,784	42,805,593,731	26,554,456	3,475,449,022	673	42,805,000,000	26,554,000	3,474,000,000	661
34	114,735	450,796,489,773	219,871,439	35,614,070,731	609	450,795,000,000	219,863,000	35,599,000,000	597
35	22,738	48,792,990,494	48,681,248	7,482,777,189	342	48,793,000,000	48,681,000	7,472,000,000	339
36	184,429	545,105,197,728	317,656,241	42,473,688,449	520	545,050,000,000	317,630,000	42,457,000,000	537
37	148,681	385,704,346,510	220,657,509	47,302,556,210	577	385,732,000,000	220,669,000	47,304,000,000	573
38	23,188	45,749,016,308	88,066,741	31,913,010,469	205	45,743,000,000	88,071,000	31,915,000,000	228
39	221,321	587,931,065,775	449,845,385	81,673,630,520	498	587,929,000,000	449,851,000	81,668,000,000	497
40	73,907	169,263,894,382	217,909,710	51,261,601,914	536	169,262,000,000	217,905,000	51,251,000,000	531
41	70,445	147,009,760,742	106,728,439	31,944,762,113	902	147,065,000,000	106,742,000	31,974,000,000	890
42	205,959	550,646,005,477	418,494,899	76,735,264,337	506	550,644,000,000	418,478,000	76,704,000,000	517
44	24,073	45,574,677,417	26,718,903	1,883,480,589	388	45,575,000,000	26,719,000	1,882,000,000	381
45	81,883	159,801,723,703	99,936,700	26,532,896,118	573	159,760,000,000	99,936,000	26,526,000,000	567
46	31,072	58,621,208,394	70,356,028	27,889,813,538	333	58,621,000,000	70,357,000	27,891,000,000	328
47	119,696	329,410,866,918	187,514,565	48,274,683,739	652	329,399,000,000	187,514,000	48,264,000,000	653
48	267,822	1,897,634,424,404	1,686,251,041	243,774,787,040	485	1,897,658,000,000	1,686,264,000	243,743,000,000	481
49	53,629	108,593,502,646	89,125,469	29,916,671,637	1,213	108,593,000,000	89,129,000	29,911,000,000	1,201
50	22,781	24,979,658,715	17,861,581	3,324,773,460	463	24,980,000,000	17,862,000	3,324,000,000	470
51	109,397	238,579,111,376	173,467,613	30,095,462,120	373	238,576,000,000	173,461,000	30,082,000,000	395
53	93,931	296,861,110,527	183,124,475	46,745,590,513	1,130	296,901,000,000	183,138,000	46,771,000,000	1,131
54	32,003	54,760,106,978	174,739,583	56,676,590,263	437	54,759,000,000	174,741,000	56,674,000,000	448
55	137,727	311,934,891,490	234,982,395	53,496,608,362	640	311,937,000,000	234,984,000	53,485,000,000	641
56	15,868	25,469,837,211	421,903,084	461,803,140,486	430	25,470,000,000	421,925,000	461,804,000,000	412

Comparison of Published CVs and CVs Produced Using the PUM File GVF  
for Selected Shipment Characteristics

**Table C1: Comparison of GVF CVs with Published CFS CVs - Mode**

Mode	PUM File GVF CVs				Published CVs			
	VALUE	WGHT	Ton-Miles	Avg miles/ shipment	Shipment Value	Shipment Weight	Ton-Miles	Avg miles/ shipment
Total	0.77	1.59	2.83	4.33	1.1	1.8	3.7	3.4
00	25.64	31.37	32.49	8.43				
02	13.46	18.66	20.14	5.82				
03	29.23	34.67	36.01	15.44				
04	1.37	2.63	4.16	5.06	0.8	2.1	1.6	4.3
05	1.37	2.62	4.16	12.31	1.8	1.4	3.4	16.4
06	7.59	11.54	13.41	5.86	5.4	8.0	9.1	2.7
07	36.37	40.61	43.10	14.59				
08	18.45	24.16	25.35	11.31	19.9	16.4	17.3	21.3
09	38.21	41.99	45.00	13.40	25.0	19.5	23.3	7.9
10	23.99	29.78	30.88	7.28	23.5	25.2	30.1	10.4
101	32.62	37.61	39.34	8.22	32.9	25.8	22.9	10.5
11	6.03	9.49	11.43	4.72	4.5	7.2	13.4	8.8
12	16.72	22.30	23.58	22.11	9.3	11.0	S	S
13	15.42	20.87	22.22	6.28				
14	1.63	3.05	4.67	4.22	1.4	3.0	2.6	2.6
15	9.83	14.36	16.09	5.68	5.5	7.2	5.7	6.0
16	18.64	24.35	25.54	6.24	15.4	22.7	38.5	7.3
17	32.76	37.72	39.47	10.71	13.0	20.1	26.2	25.6
18	36.63	40.81	43.37	10.22	33.3	36.6	32.2	S
19	36.47	40.69	43.20	70.03	31.8	18.1	22.7	S
20	26.87	32.52	33.70	6.43				

**Table C2: Comparison of GVF CVs with Published CFS CVs - Commodity**

SCTG	PUM File GVF CVs				Published CVs			
	VALUE	WGHT	Ton-Miles	Avg miles/shipment	Shipment Value	Shipment Weight	Ton-Miles	Avg miles/shipment
Total	0.77	1.59	2.83	4.33	1.1	1.8	3.7	3.4
00	25.64	31.37	32.49	8.43				
01-05	21.47	27.29	28.39	6.40				
01	19.20	24.95	26.11	8.48	24.6	24.7	22.2	19.2
02	8.92	13.23	15.03	10.35	9.7	10.3	20.9	13.0
03	6.63	10.29	12.21	6.79	5.4	4.9	10.6	15.9
04	7.10	10.91	12.81	6.68	5.9	6.5	6.1	18.0
05	6.28	9.82	11.75	9.85	3.3	3.3	4.1	8.8
06-09	22.24	28.05	29.15	7.95				
06	6.68	10.36	12.27	10.55	5.2	6.8	9.6	25.3
07	3.97	6.63	8.57	7.16	3.6	3.5	7.9	18.5
08	5.19	8.34	10.30	12.85	1.6	2.9	4.3	20.3
09	10.27	14.89	16.60	6.25	15.0	13.1	15.6	19.7
10-14	21.55	27.36	28.46	9.81				
10	14.52	19.87	21.28	13.37	17.0	11.3	10.4	11.7
11	8.43	12.61	14.44	17.03	10.3	14.0	10.3	12.7
12	5.29	8.49	10.44	18.89	2.7	2.9	6.5	7.7
13	10.28	14.91	16.61	10.04	8.2	8.4	6.4	17.9
14	16.06	21.58	22.90	9.04	9.5	21.9	26.5	21.3
15-19	24.42	30.20	31.30	10.42				
15	11.88	16.83	18.42	15.17	5.5	7.2	13.6	4.8
17	7.58	11.53	13.40	17.46	4.3	4.2	9.5	10.2
18	6.36	9.93	11.86	19.27	7.7	9.7	27.2	8.9
19	4.56	7.47	9.42	11.66	6.0	8.9	20.3	9.7
20-24	20.09	25.87	27.01	7.52				
20	5.24	8.42	10.37	5.82	5.2	3.4	5.3	18.0
21	5.51	8.78	10.73	6.15	2.5	7.2	8.5	12.2
22	9.01	13.34	15.13	12.32	6.6	15.6	12.2	11.4
23	4.46	7.32	9.27	5.80	6.5	6.7	5.5	4.6
24	3.23	5.55	7.44	5.44	3.4	5.6	6.3	11.0
25-30	20.18	25.97	27.10	5.85				
25	15.29	20.73	22.09	11.93	17.0	25.1	20.2	29.4
26	4.20	6.95	8.89	7.53	2.6	7.2	6.9	6.1
27	6.29	9.84	11.77	8.66	3.2	4.5	3.8	13.8
28	5.27	8.45	10.40	5.97	2.5	3.5	3.6	11.0
29	3.82	6.40	8.33	6.36	4.3	8.0	9.2	17.1
30	3.71	6.25	8.17	4.55	8.8	8.0	11.0	2.3
31-34	21.42	27.23	28.33	6.39				
31	4.02	6.69	8.63	6.76	2.2	3.5	2.5	8.0
32	3.94	6.58	8.51	7.25	2.2	3.1	2.8	6.0
33	3.54	6.00	7.91	5.85	2.5	3.1	2.9	4.4
34	3.36	5.73	7.64	6.20	2.8	9.5	6.0	4.7
35-38	24.02	29.81	30.91	7.40				
35	3.09	5.33	7.21	4.86	3.4	3.8	4.0	4.8
36	3.97	6.63	8.57	6.14	2.4	4.5	7.9	8.9
37	7.08	10.87	12.77	5.66	6.4	9.3	11.6	4.9
38	4.59	7.51	9.46	4.93	3.1	18.6	8.7	3.0
39-99	22.58	28.40	29.49	6.41				
39	5.48	8.74	10.69	5.18	10.8	12.1	6.7	7.8
40	3.37	5.75	7.65	4.51	3.7	10.9	6.0	3.3
41	7.36	11.25	13.13	10.33	9.2	8.1	17.5	9.2
43	3.26	5.59	7.48	6.28	3.4	3.3	4.7	9.5
99	45.04	46.03	52.92	22.37	37.9	33.0	28.0	19.4

**Table C3: Comparison of GVF CVs with Published CFS CVs - Origin State**

Origin State	PUM File GVF CVs				Published CVs			
	VALUE	WGHT	Ton-Miles	Avg miles/shipment	Shipment Value	Shipment Weight	Ton-Miles	Avg miles/shipment
Total	0.77	1.59	2.83	4.33	1.1	1.8	3.7	3.4
00	41.31	44.08	48.36	10.52				
01	5.55	8.83	10.78	7.48	5.9	7.3	6.9	6.2
02	10.78	15.51	17.18	11.81	18.1	15.9	16.0	14.4
04	6.08	9.56	11.50	5.50	6.9	9.9	10.7	9.3
05	7.50	11.43	13.31	8.12	6.1	7.6	9.7	6.3
06	2.98	5.18	7.05	4.65	2.9	3.3	7.4	8.2
08	6.15	9.65	11.58	5.76	6.3	8.2	9.2	10.5
09	5.80	9.17	11.12	6.45	14.6	22.2	34.6	5.4
10	9.35	13.76	15.53	7.65	18.0	20.6	15.8	17.2
11	18.71	24.43	25.61	17.82	18.4	27.2	S	S
12	4.08	6.79	8.73	5.51	4.3	14.4	10.9	8.1
13	4.61	7.53	9.49	6.46	4.1	12.3	5.4	6.5
15	8.46	12.66	14.48	6.82	15.8	19.4	S	14.8
16	8.35	12.51	14.34	6.63	10.1	14.2	17.5	15.9
17	4.10	6.81	8.76	6.08	4.1	4.7	7.8	4.4
18	4.46	7.32	9.27	6.19	4.8	5.6	4.7	7.6
19	5.81	9.19	11.14	7.36	4.3	8.3	10.3	15.5
20	5.69	9.03	10.97	6.30	9.3	15.0	40.6	5.5
21	5.45	8.71	10.66	5.66	5.8	19.0	22.8	5.5
22	5.92	9.34	11.28	9.15	8.1	9.2	12.1	10.1
23	8.69	12.95	14.76	6.65	8.9	16.9	15.0	13.9
24	5.94	9.37	11.31	9.36	15.6	6.8	8.6	23.0
25	5.21	8.37	10.33	6.57	11.9	25.0	13.4	8.9
26	4.34	7.15	9.10	5.92	4.3	6.5	8.8	8.3
27	4.67	7.61	9.57	5.04	4.1	11.9	13.5	10.7
28	7.67	11.65	13.52	7.43	15.9	25.4	11.5	5.6
29	4.88	7.91	9.87	6.27	6.6	6.2	8.8	6.0
30	8.82	13.11	14.91	7.35	10.9	18.8	20.1	10.1
31	6.48	10.09	12.02	7.12	7.0	16.4	24.2	11.1
32	7.49	11.41	13.29	5.41	11.2	21.2	7.2	8.7
33	7.28	11.14	13.03	6.20	6.7	19.2	22.3	12.3
34	4.87	7.91	9.86	5.92	4.9	12.1	7.9	10.0
35	9.23	13.62	15.39	8.43	20.0	29.5	13.8	12.6
36	3.96	6.61	8.55	6.04	3.7	6.2	5.9	10.8
37	4.36	7.18	9.13	5.91	4.1	6.2	5.8	7.9
38	9.17	13.54	15.32	10.20	10.3	17.7	12.1	35.4
39	3.65	6.16	8.08	6.04	4.5	6.1	5.4	4.6
40	5.86	9.25	11.20	6.45	11.3	15.8	21.1	12.4
41	5.97	9.41	11.35	5.32	6.6	15.4	10.0	8.4
42	3.77	6.34	8.26	6.04	5.4	7.0	9.1	4.6
44	9.04	13.38	15.17	8.00	13.4	18.9	18.6	17.6
45	5.62	8.93	10.88	6.23	4.8	6.4	6.9	8.3
46	8.23	12.36	14.19	8.30	29.7	11.4	17.6	25.6
47	4.79	7.78	9.74	5.75	5.1	9.0	8.3	3.4
48	3.34	5.71	7.61	6.01	4.8	7.6	7.3	6.4
49	6.67	10.33	12.25	4.87	9.2	15.1	22.7	7.2
50	9.22	13.61	15.39	7.52	11.5	25.4	12.3	10.9
51	4.97	8.04	10.00	7.15	5.7	4.2	7.8	10.8
53	5.30	8.50	10.45	4.77	7.4	11.1	5.4	10.5
54	8.14	12.24	14.08	7.47	8.0	13.6	17.5	11.7
55	4.50	7.39	9.34	5.72	4.1	11.6	9.6	4.7
56	10.49	15.16	16.85	7.97	16.1	19.6	19.6	18.5