

Report 4 (R4)

FAF Commodity Classification

The Freight Analysis Framework (FAF) requires a system for distinguishing types of commodities in the United States. The system must: (1) be tied to the industries which create and ship goods; (2) identify major commodities carried by each mode of transportation and each significant intermodal combination; and (3) be linked to classifications used for international trade. The original FAF used the Standard Transportation Commodity Code (STCC) system, developed initially in the 1960s for analyses involving the railroad industry. The second-generation FAF, called FAF², uses the Standard Classification of Transported Goods (SCTG), developed in the 1990s by the statistics agencies in the United States and Canada to provide better detail of commodities not typically carried by rail and to provide better comparability with the Harmonized System (HS) used worldwide for international trade.

Standard Transportation Commodity Codes (STCC)

Background

The STCC system was developed in the 1960s as a comprehensive commodity classification system. The system was designed by a special committee of the Association of American Railroads (AAR) and was used in the first Census of Transportation in 1963.

Currently, the STCC is maintained and published by the AAR. The code has been updated by AAR over the years to meet the needs of its users, particularly the North American Freight Railroads. The annual Railroad Waybill data, 1993 Commodity Flow Survey (CFS), and the first generation of the FAF all used the STCC coding system.

Structure of the Coding System

The hierarchical STCC structure allows data collapsibility. This feature enables the summarization of meaningful commodity information at various levels. For example, the 2-digit STCC of '01' represents 'Farm Products,' the 3-digit of '011' identifies 'Field Crops,' the next level '0112' indicates 'Raw Cotton,' and at the 5-digit level '01121' pinpoints to 'Raw Cotton in Bales.' Note that the 1993 CFS used the 5-digit STCC as its commodity reporting level and data was generally published in 2- and 3-digit commodity levels. While FAF flows were estimated at the 4-digit STCC level, information was typically reported at the 2-digit commodity level. Although data on the Surface Transportation Board (STB) Carload Waybill Sample is at the 7-digit STCC level, the STB Public-Use Waybill data is only available in the 5-digit STCC.

Generally, the first four digits of the STCC represents the industry that produced the commodity, based on the Standard Industrial Classification (SIC) system. The fifth digit of STCC provides product classes within the producing industries. The last two digits of the STCC add commodity detail of particular interest to the railroads. A summary of the various 5-digit STCC levels is presented in Table 1. The top level (2-digit) STCC codes are listed in Table 2.

Table 1. Level of Classifications in STCC (5-digit)

Level	Number of Categories*	Grouping (example)
2-digit	37	Major industry classes (01 - Farm Products)
3-digit	182	Minor industry classes (012 - Fresh Fruits or Tree Nuts)
4-digit	444	Specific industries (0121 - Citrus Fruits)
5-digit	1,202	Product classes (01214 - Oranges)

* Based on the 2003 version of STCC codes from the AAR.

Weakness

The STCC was developed primarily to support the analysis and regulation of railroads. Consequently, its classification details were tailored for railroad but were less adequate for commodities typically carried by truck or air cargo. The large number of categories in the 5-digit STCC system (over 1,200 codes) also creates a burden to respondents who use this commodity coding system.

The use of the SIC system in the STCC supports linkages between of shipper and shipment information, but the SIC system has evolved over the years and more recently has been replaced by the North American Industrial Classification System (NAICS). The STCC has not kept pace with these changes, reducing the comparability of commodity and economic data.

While crosswalks are available between STCC and HS codes, international trade in electronics and other commodities not historically carried by railroads is poorly represented in the STCC.

Strength

By design, the STCC has excellent detail for commodities carried by railroads. Under the STCC system, hazardous materials as well as waste that are hazardous can also be readily identified. Because bulk commodities are well represented, the STCC also works well for domestic water transport.

Table 2. Two-digit STCC Definitions

STCC	Description
01	Farm Products
08	Forest Products
09	Fresh Fish or Other Marine Products
10	Metallic Ores
11	Coal
13	Crude Petroleum, Natural Gas, or Gasoline
14	Non-metallic Minerals
19	Ordinance or Accessories
20	Food or Kindred Products
21	Tobacco Products, excluding Insecticides
22	Textile Mill Products
23	Apparel or Other Finished Textile Products
24	Lumber or Wood Products, excluding Furniture
25	Furniture or Fixtures
26	Pulp, Paper, or Allied Products
27	Printed Matter
28	Chemicals or Allied Products
29	Petroleum or Coal Products
30	Rubber or Miscellaneous Plastics Products
31	Leather or Leather Products
32	Clay, Concrete, Glass, or Stone Products
33	Primary Metal Products
34	Fabricated Metal Products
35	Machinery, excluding Electrical
36	Electrical Machinery, Equipment, or Supplies
37	Transportation Equipment
38	Instruments, Photographic Goods, Optical Goods, Watches, or Clocks
39	Miscellaneous Products of Manufacturing
40	Waste or Scrap Materials
41	Miscellaneous Freight Shipments
42	Containers, Carriers or Devices, Shipping, Returned Empty
43*	Mail
44*	Freight Forwarder Traffic
45*	Shipper Association or Similar Traffic
46*	Freight All Kinds
47*	Small Packages, LTC or LTL
48	Waste Hazardous Materials or Waste Hazardous Substances
49*	Hazardous Materials
50*	Bulk Movement in Boxcars

* Classification codes that were not used in the 1993 CFS.

Note: FAF also included a code '99' for 'LTL-General Cargo.'

Standard Classification of Transported Goods (SCTG)

Background

The U.S. Department of Transportation, U. S. Bureau of the Census, Statistics Canada, and Transport Canada developed the SCTG to replace the STCC for the 1997 and subsequent CFS and to integrate separate commodity classification systems used in Canada. The SCTG is maintained by Statistics Canada.

Structure of the Coding System

The SCTG structure is hierarchical. It comprises four levels (i.e., 2- to 5-digits) that aggregate HS 4- or 6- digit classes. The SCTG groupings were designed to create statistically significant transportation categories. Specifically, each level of the SCTG covers the universe of transported goods, and each category in each level is mutually exclusive.

At the most aggregated level (i.e., 2-digit), the SCTG was designed to provide analytically useful commodity groupings for users that are interested in an overview of transported goods. With a small number of exceptions, categories in the 3-digit level were designed to include goods for which significant product movements are expected to be recorded in both the United States and Canada. Therefore, the 3-digit categories provided the best basis for U.S.-Canadian comparisons.

The 4-digit SCTG categories were created to reflect industry patterns and transportation characteristics often not provided in the HS. The most detailed SCTG category, which is at 5-digit level, is the collection level for the CFS. At this level, each category was designed to capture significant details that reflect industry patterns and transportation characteristics. Because most 4- and 5-digit SCTG categories primarily contain the products of only one industry, they can be associated with the SIC, as well as with the NAICS. This feature allows comparisons to be conducted with industry data, as well as other SIC-based classifications such as the STCC system. Because of data confidentiality, insignificant sample size, or data-reliability issues, statistics at the more-detailed SCTG categories (4- and 5-digit) are generally unpublished in the U.S., however.

The number of categories in each level of SCTG, as used in the 2002 CFS, is summarized in Table 3. The first level categories, 2-digit coding, of SCTG is listed in Table 4.

Table 3. Level of Classifications in SCTG

Level of Hierarchy	Number of Categories*	Information Provided
First level, 2-digits	42	Analytical overview
Second level, 3-digits	133	U.S.-Canadian product groups
Third level, 4-digits	283	Transportation characteristics
Fourth level, 5-digits	504	CFS 2002 collection level

* Categories as defined for 2002 CFS.

Weakness

The SCTG does not identify specific categories of products as being hazardous. It does not include any special groupings in its categories under the title of “hazardous.” This is a limitation by design, because a separate system for categorizing hazard classes is used in the CFS.

Strength

Commodity classifications in the SCTG reflect more adequately on goods movements for all modes, rather than a single mode (i.e., railroads) as in the STCC system. In addition, the number of categories in the more-detailed levels of SCTG has been dramatically reduced from the number of categories used in the STCC (see Tables 3 and 1, respectively). Consequently, the burden to users of the 4- or 5-digit SCTG commodity codes would be much less than that of the same level STCC system.

By design, SCTG classification made the transportation data from the U.S. and Canada comparable. Furthermore, the HS-based SCTG coding also allows other international comparisons (i.e., imports and exports). As a result, SCTG creates an integrated commodity classification system that is useful for economic analysis, including production, shipments, and international trades.

Table 4. First Level (2-digit) SCTG Definitions

SCTG	Description
01	Live Animals and Fish
02	Cereal Grains (including seed)
03	Other Agricultural Products, except for Animal Feed
04	Animal Feed and Products of Animal Origin, n.e.c.
05	Meat, Fish, and Seafood, and Their Preparations
06	Milled Grain Products and Preparations, and Bakery Products
07	Other Prepared Foodstuffs, and Fats and Oils
08	Alcoholic Beverages
09	Tobacco Products
10	Monumental or Building Stone
11	Natural Sands
12	Gravel and Crushed Stone
13	Non-Metallic Minerals, n.e.c.
14	Metallic Ores and Concentrates
15	Coal
16	Crude Petroleum Oil
17	Gasoline and Aviation Turbine Fuel
18	Fuel Oils
19	Coal and Petroleum Products, n.e.c.
20	Basic Chemicals
21	Pharmaceutical Products
22	Fertilizers
23	Chemical Products and Preparations, n.e.c.
24	Plastics and Rubber
25	Logs and Other Wood in the Rough
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
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
36	Motorized and Other Vehicles (including parts)
37	Transportation Equipment, n.e.c.
38	Precision Instruments and Apparatus
39	Furniture, Mattresses and Mattress Supports, Lamps, Lighting Fittings, and Illuminated Signs
40	Miscellaneous Manufactured Products
41	Waste and Scrap
43	Mixed Freight

n.e.c. = not elsewhere classified

Conclusions

The SCTG provides a more effective commodity classification for the FAF than the STCC system for several reasons.

1) For reasons of comparability with the Economic Census and of transparency, the second generation FAF is based primarily on the CFS. The CFS shifted from the STCC system to SCTG in 1997 to better represent commodities carried by modes other than railroads, such as electronic components, and to put less emphasis on commodities which are no longer shipped in significant quantities, such as several wood products.¹ The adoption of SCTG by CFS, alone, places the burden on defending the continued use of STCC in FAF, as opposed to moving to SCTG.

2) The SCTG is tied more closely to the HS and is used in Canada, assuring comparability with trade data that are essential for estimates by the FAF of the domestic transportation of international trade.

3) The number of categories in the more-detailed levels of SCTG has been dramatically reduced from the number of categories used in the STCC. Consequently, the burden to users of the 4- or 5-digit SCTG commodity codes would be much less than that of the same level STCC system.

4) While the STCC system has a category for hazardous materials and the SCTG does not, the STCC does not characterize the nature of the hazard. The CFS uses a supplemental classification system for hazardous cargo, which can be used in conjunction with the SCTG to provide a more complete representation than is possible with the STCC system.

References

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¹ For a more complete description of the shift from STCC to SCTG in the CFS, see http://www.bts.gov/programs/commodity_flow_survey/methods_and_limitations/commodity_classification_in_1997/background.html

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