

# Freight Analysis Framework version 3 (FAF3)

**Center for Transportation Analysis (CTA) Research Areas**

Aviation Safety
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The Freight Analysis Framework version 3 (FAF3) database is a Federal Highway Administration (FHWA) freight data product which is composed of U.S. domestic international freight flows for calendar year 2007. FAF3 freight flows are reported in terms of a) the annual tons moved and b) the monetary value, in 2007 dollars, of the goods traded. The complete FAF3 ODCM freight flow matrix is made up of 131 Origin x 131 Destination x 43 Commodity Class x 7 Modal category (i.e. annual tons, dollars) data cells or 103,466,944 flow estimates in total.

FAF3 is constructed for FHWA by Oak Ridge National Laboratory (ORNL), with the assistance of staff at the Battelle Memorial Institute and at MacroSys, Inc.

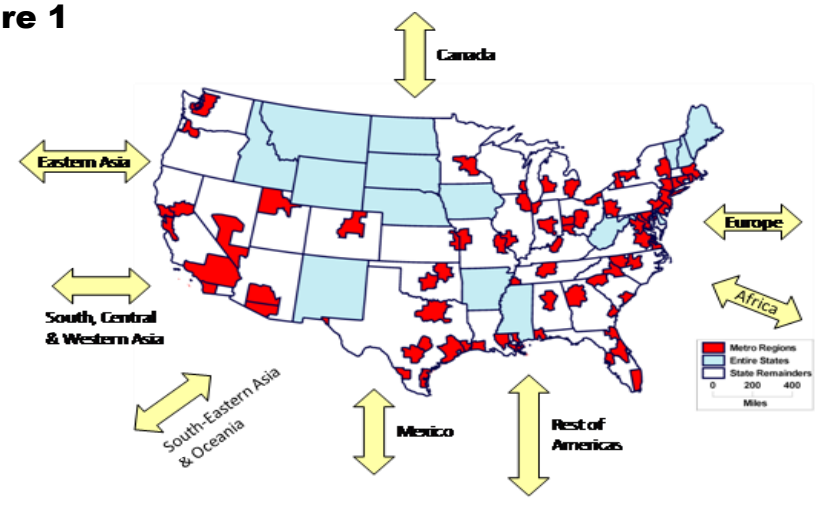
Due to different and improved methods used for development of FAF3, direct comparisons should not be made between previous year versions of FAF (1997, 2002) and FAF3. Future products will include reprocessed 1997 and 2002 data to enable users to perform train analysis.

## FAF3 Geography

Figure 1 shows the analysis regions, also referred to as FAF3 analysis zones. These are the same freight analysis zones used by the 2007 U.S. Commodity Flow Survey.

Three subsets of regions are highlighted: 74 metropolitan area determined regions, 33 regions made up of state remainders, representing a state's territory outside these metropolitan regions, and 16 regions identified as entire states, within no single FAF3 metropolitan region exists.

**Figure 1**

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## Methods and Data Source Improvements

With this latest version of the FAF, a number of improvements to the commodity flow matrix have been possible over previous versions. These include:

- The use of PIERS data to support improved estimates of the allocations of imports and exports to FAF domestic zones of freight origination (for U.S. exports) and destinations (for U.S. Imports).
- A doubling of the number of U.S. Shipping establishments sampled as part of the 2007 U.S. CFS (from some 50,000 establishments in 2002, to approximately 100,000 establishments surveyed in 2007;
- Incorporation of additional federal datasets within an improved FAF3 log-linear modeling0iterative proportional fitting algorithm;
- Greater use of U.S. inter-industry input-output ('use' and 'make') coefficients in additional federal datatsets in the development of the FAF3 out of scope (to the 2007 CFS) commodity flow estimates.
- The ability to access FAF3 data products via a user friendly web-based data set construction and download tool (http://faf.ornl.gov/fafweb).

## FAF3 Commodity and Mode Classes

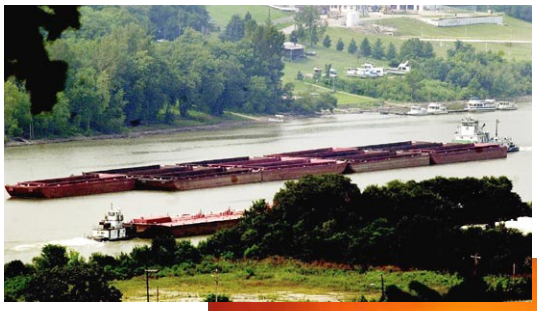
FAF3 reports annual tonnage and dollar valued freight flows using the same 43 2-digit Standard Classification of Transported Goods (SCTG) classes used by the 2007 U.S. Commodity Flow Survey (CFS). These flows are also broken down by 7 modes of transportation: Truck, Rail, Water, Air (includes truck-air), Multiple Modes and Mail, Pipeline, and Other/Unknown. The "multiple modes and mail" category includes truck-rail, truck-water, and rail-water intermodal shipments involving one or more end-to-end transfers of cargo between two different modes.

## Overview of the FAF Modeling Process

The approach combines the results of filling gaps in the CFS, using a variety of missing value inferencing techniques, with the results applying spatial interaction and other data models to a variety of carrier reported and economic activity data, to estimate the 40 percent or so of U.S. freight movements that are not captured by the CFS.

## Future FAF3 Products

The FAF3 ODCM annual freight flows matrix is being used to develop a number of additional FAF3 data products.



FAF3.1 will be released in the Fall 2010 to include: a set of U.S. highway network link- and route-based truck flow assignments; a set of freight flow forecasts from 2015-2040 in 5 year increments; updates as necessary to the database; and provisional estimates for 2009. FAF3.2 will see release in 2011 to include a reprocessing of the 1997 FAF and 2002 FAF databases to enable time-series comparisons with FAF3 .

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