

Bureau of Transportation Statistics Special Report

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A Decade of Growth in Domestic Freight *Rail and Truck Ton-Miles Continue to Rise*

by Scott M. Dennis, Ph.D.

Domestic freight traffic carried by air, truck, rail, water, and pipeline totaled more than 4.5 trillion ton-miles in 2005—an increase of more than 350 billion over the 1996 total. This 8.7 percent growth in ton-miles, the primary physical measure of freight transportation output, reflects a 0.9 percent compound annual growth rate between 1996 and 2005, the latest year for which complete data are available. However, the overall growth masks some notable differences among modes, with ton-miles in three modes (rail, truck, and air) increasing while ton-miles in the other two modes (pipeline and water) declined over the 10-year span. Figure 1 illustrates the growth of domestic freight ton-miles during this time period.¹

While there was mostly year-to-year growth in overall ton-miles during the decade, it is estimated that total domestic ton-miles declined from 4.542 trillion in 2004 to 4.538 trillion in 2005, a decline of 0.1 percent. This preliminary estimate is essentially unchanged for 2005 relative to the previous year.

Modal Trends

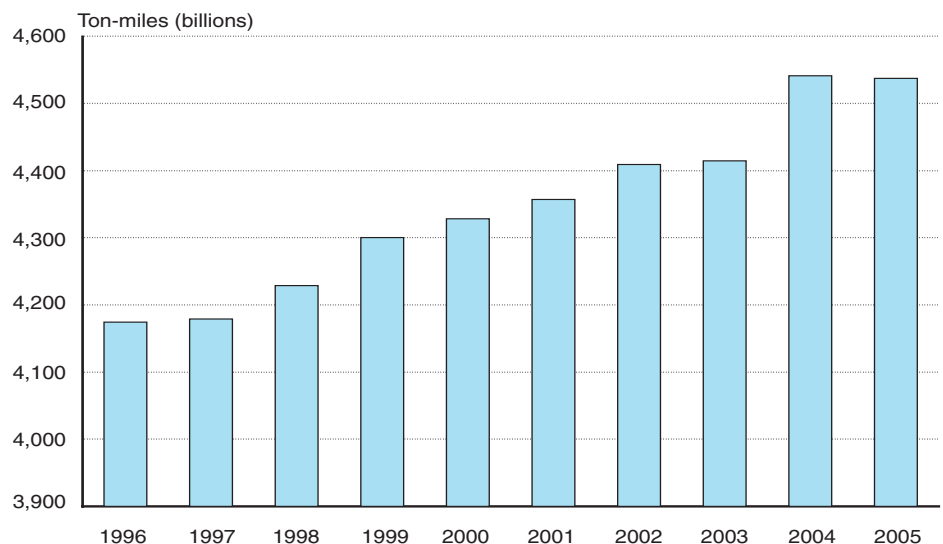
The two largest modes in terms of ton-miles, rail and truck, grew the fastest between 1996 and 2005—25.9 percent for rail (a compound annual

growth rate of 2.6 percent) and 21.8 percent for trucks (a compound annual growth rate of 2.2 percent). The growth of these two modes reflects the continued growth of the goods sector of the economy generally. Air freight ton-miles, while a small fraction of railroad and truck ton-miles, also grew faster than domestic freight ton-miles as a whole—14.3 percent over the period (a compound annual growth rate of 1.5 percent). The growth pattern of air freight ton-miles over the period reflects a dramatic decline in air traffic after September 11, 2001 and its subsequent recovery. Figure 2 presents

What is a ton-mile?

A ton-mile is defined as one ton of freight shipped one mile and, therefore, reflects both the volume shipped (tons) and the distance shipped (miles). Ton-miles provide a key measure of the overall demand for freight transportation services, which in turn reflects the overall level of industrial activity in the economy. In addition, ton-miles are used to calculate other measures of transportation system performance, such as energy efficiency and accident, injury, and fatality rates.

Figure 1: Total U.S. Domestic Freight Ton-Miles



SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, calculations using data from various sources. See box at the end of this report for details.

¹ Ton-miles do not reflect revenues earned or the value of commodities transported.

the ton-mile data for each mode as an index, showing the change for each mode relative to its 1996 value.

Pipeline traffic declined by 5.5 percent from 1996 to 2005 (a compound annual growth rate of -0.6 percent). The decline in pipeline ton-miles largely reflects the decline in domestic petroleum production. Waterborne ton-miles declined by 22.7 percent over the period (a compound annual growth rate of -2.8 percent). The decline in waterborne ton-miles is primarily due to declining coastwise shipments of Alaskan petroleum.

Market Share

Figure 3 illustrates the market shares as measured by ton-miles for each of the modes in 1996 and 2005. Although the rank order for each mode did not change, nevertheless there were shifts in market shares among the five modes.

While the market shares in this figure illustrate the primary physical measure of freight transportation output, they do not reflect the revenues earned or value of commodities transported by various modes.

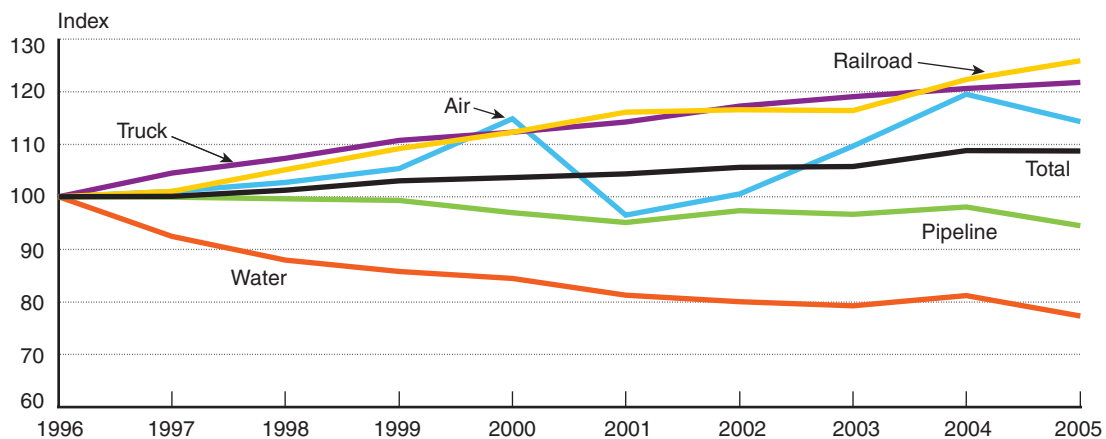
The railroad mode includes large Class I railroads (2005 operating revenue in excess of \$319.3 million) as well as smaller local and regional railroads. Railroads carry the largest share of ton-miles, with a market share of 38.2 percent in 2005, up from 33.0 percent in 1996. Trucking, which includes both local and intracity truck transportation, carries the next largest share at 28.5 percent—a more than 3-percentage point increase from 1996. Pipelines, which include crude petroleum, petroleum products, and natural gas pipelines, account for 19.9 percent of domestic freight ton-miles—a 3.0 percent decline in market share over the 10-year span. Waterborne traffic, which includes

Table 1: U.S. Domestic Freight Ton-Miles by Mode (ton-miles, billions)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Percent Change 1996 - 2005
Air	13.8	13.9	14.1	14.5	15.8	13.3	13.8	15.1	16.5	15.7	14.3%
Truck	1,062.0	1,110.6	1,139.8	1,176.4	1,192.8	1,213.2	1,245.5	1,264.8	1,281.6	1,293.3	21.8%
Railroad	1,377.1	1,391.1	1,448.4	1,503.7	1,546.3	1,599.3	1,605.5	1,603.6	1,684.5	1,733.8	25.9%
Water	764.7	707.4	672.8	655.9	645.8	621.7	612.1	606.1	621.2	591.3	-22.7%
Coastwise	408.1	349.8	314.9	292.7	283.9	274.6	263.7	278.9	279.9	263.5	-35.4%
Lakewise	58.3	62.2	61.7	57.0	57.9	50.9	53.7	47.5	55.7	51.9	-11.0%
Internal	296.8	294.0	294.9	304.7	302.6	294.9	293.4	278.4	284.1	274.4	-7.6%
Intraport	1.5	1.4	1.4	1.4	1.5	1.4	1.3	1.3	1.5	1.5	3.1%
Pipeline	956.6	956.5	953.5	950.2	927.9	910.0	932.0	925.2	938.0	903.8	-5.5%
Oil & Oil Products	619.2	616.5	619.8	618.0	577.0	576.0	586.0	590.0	599.6	572.0	-7.6%
Natural Gas	337.4	340.0	333.7	332.2	350.9	334.0	346.0	335.2	338.4	331.8	-1.7%
TOTAL	4,174.1	4,179.4	4,228.6	4,300.6	4,328.6	4,357.5	4,409.0	4,414.8	4,541.7	4,537.9	8.7%

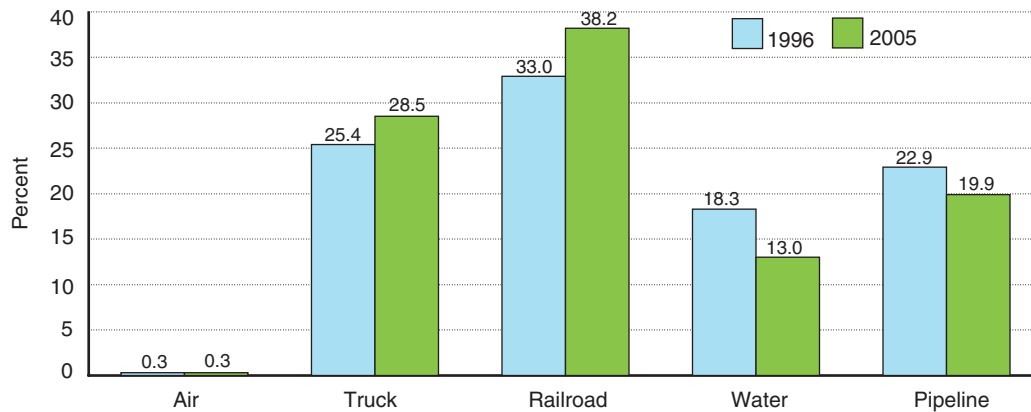
SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, calculations using data from various sources. Numbers may not add to total due to rounding. See box at the end of this report for details.

Figure 2: Index of U.S. Domestic Freight Ton-Miles (1996 = 100)



SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, calculations using data from various sources. See box at the end of this report for details.

Figure 3: U.S. Domestic Freight Market Share (percent of ton-miles in 1996 and 2005)




SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, calculations using data from various sources. See box at the end of this report for details.

coastal, Great Lakes, inland waterway, and local port traffic, accounts for 13.0 percent of domestic freight ton-miles—compared to 18.3 percent in 1996. Air freight, which includes freight carried by passenger operators as well as all-cargo operators, accounts for 0.3 percent of domestic freight ton-miles.

Estimation of Ton-Miles

Several different national estimates of ton-miles have been developed by various organizations over the years. These estimates have differed in coverage and reliability. The Bureau of Transportation Statistics (BTS) is working to improve basic measures of transportation activity, including ton-miles. In this report BTS estimates for air, truck, rail, water, and pipelines were developed using a more com-

prehensive approach than was used in prior estimates. Fuller coverage is achieved by combining reported data from established sources, estimates from surveys, and calculations based on certain assumptions. For more information on the improved approach, including discussion of data sources and methods used, visit the BTS web site at www.bts.gov, and use the search engine to find improved estimates of ton-miles.

BTS has used the improved methodology to estimate ton-miles from 1980 onwards. The figures on the next page show the change in ton-miles for this period. Data points for each year from 1980 to 2005 are found in *National Transportation Statistics*, an online publication also on the BTS website, at table 1-46(b). 

About this Report

This article was prepared by Scott M. Dennis, Economist, of the Bureau of Transportation Statistics (BTS). BTS is a component of DOT's Research and Innovative Technology Administration (RITA).

The estimates in this report were developed from a variety of data sources. The principal data sources for each mode are:

- Air: USDOT, RITA, BTS, *Air Carrier Traffic Statistics Monthly*
- Truck: USDOT, RITA, BTS, *2002 Commodity Flow Survey*
- Rail: Surface Transportation Board, Carload Waybill Sample
- Water: U. S. Army Corps of Engineers, *Waterborne Commerce of the United States*
- Pipeline: Association of Oil Pipelines, *Shifts in Petroleum Transportation*; U. S. Department of Energy, Energy Information Administration, *Annual Energy Review*

For related data and publications visit www.bts.gov

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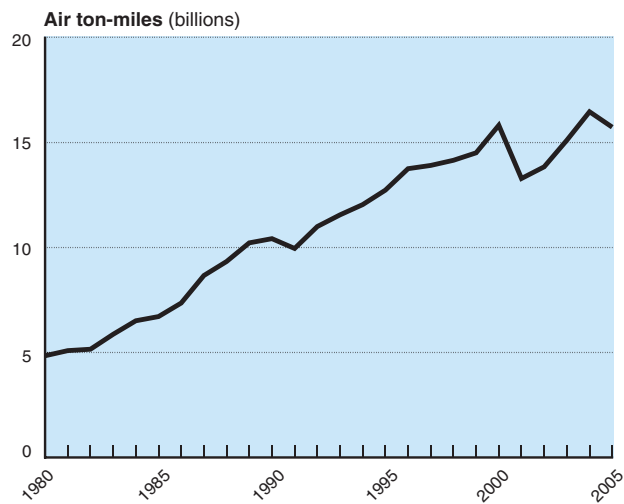
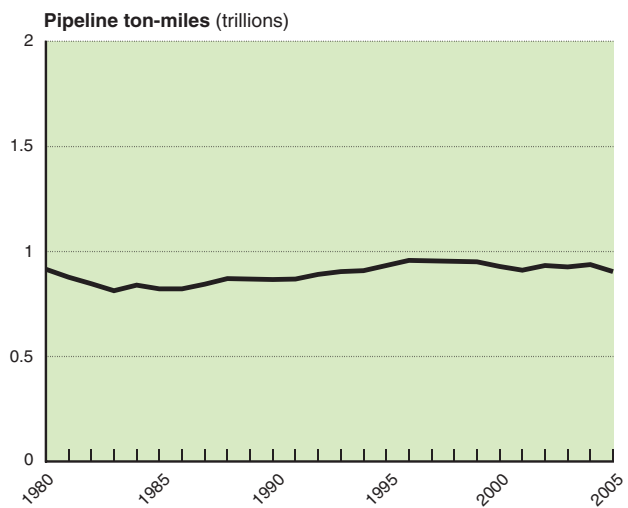
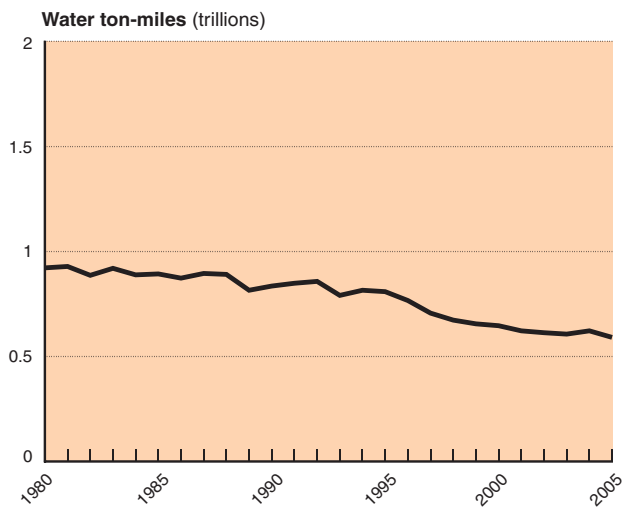
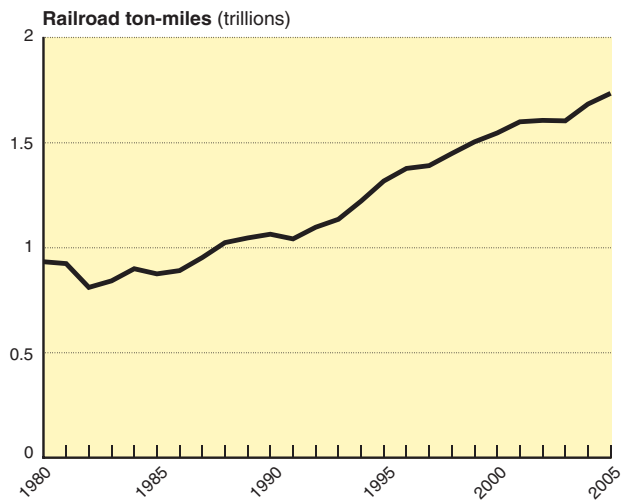
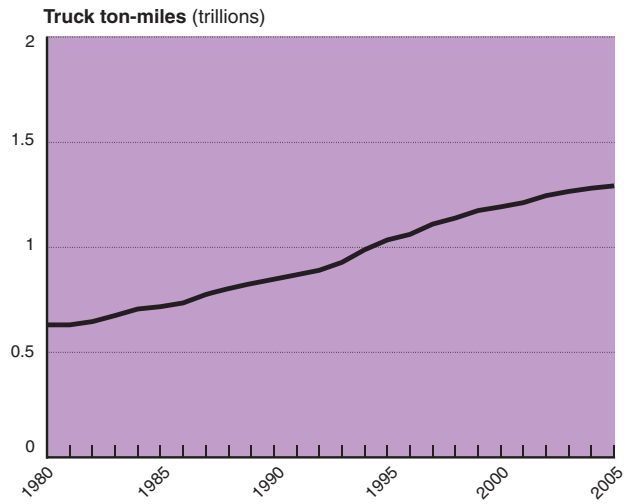
Data —

- **Commodity Flow Survey**—survey reporting value, weight, and ton-miles by commodity, mode, origin, and destination.
- **National Transportation Statistics**—ton-mile data from 1980 to present.

Publications —

- **Journal of Transportation Statistics**, Vol. 8, No. 1, Improved Estimates of Ton-Miles
- **Freight in America, A New National Picture 2006**

Figure 4: BTS Ton-mile Calculations, by Mode



NOTE: The figure for air ton-miles (blue) is in billions; the figures for truck, rail, water, and pipeline are in trillions.

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, calculations using data from various sources. See box on previous page for details.