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Pipelines Continue to Increase Share of Total Crude Oil and Petroleum Products Transported

The Association of Oil Pipe Lines (AOPL) today released its annual report showing shifts in petroleum transportation from 1990 through 2008. Volumes increased 5.3 percent from 2007 to 2008.

“The most recent data confirms pipelines continue to increase their share of the U.S. petroleum transportation market,” said Andy Black, AOPL President and CEO. “Pipelines accounted for 71 percent of all petroleum transportation in 2008, up from 66.8 percent in 2007 and 54 percent in 1990. Shippers recognize that pipelines are the most efficient, reliable, and safe method of transporting liquid fuels. The liquid pipeline industry invests in capacity expansions and upgrades of existing lines as new supply resources develop and consumer demand shifts.”

Oil pipelines are a vital part of our country’s infrastructure and have been quietly serving the nation for decades. Our transportation system—cars, delivery trucks, airplanes, trains—could not run without pipelines transporting oil to refineries, and refined products from refineries to distribution points. Almost all gasoline is transported by pipeline. Tanker trucks delivering to the local gas station usually carry gasoline only the last few miles, after picking it up from a pipeline at a distribution terminal. The American public reaps the benefits of pipeline transportation for only 2.5 cents per gallon of gasoline.

The report considers the four major modes of transportation—pipelines, water carriers, motor carriers, and railroads—and two major categories of petroleum—crude oil and petroleum products.

For 2008, total ton-miles of crude oil and petroleum products for all modes of transport increased by 5.60 percent compared with 2007. Specifically, pipelines transported 12.9 percent more crude oil and petroleum products in 2008 than in 2007. Water carriers transported 10.2 percent less in 2008 than in 2007, motor carriers transported 0.03 percent less and railroads transported 13.5 percent less.

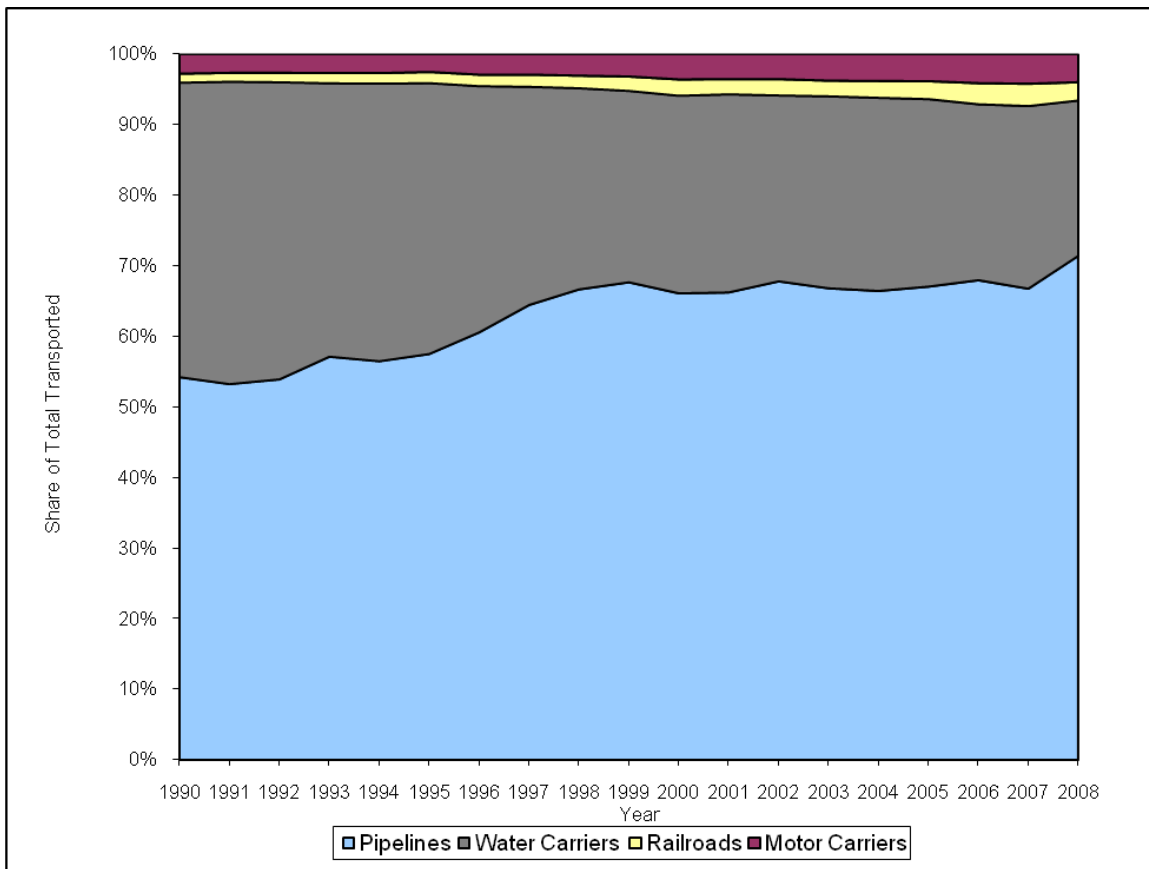
The statistics show several trends over the past two decades (See Charts and Tables within the Report):

- Pipelines accounted for 71 percent of all petroleum transportation in 2008—up from about 54 percent in 1990 (Chart 1).
- Pipelines in 2008 were the largest conveyors of both crude oil (83 percent, up from 53 percent in 1990) and petroleum products (62 percent, up from 56 percent in 1990). Water carriers provided the second highest level of ton-miles in 2008—16 percent of crude oil and 27 percent of petroleum products. (Tables 2 and 3).
- Pipelines and water carriers are the two main modes of transport but their relative importance has gradually changed. In 1990 pipeline ton-miles were about 30 percent higher than water carriers. In 2008, pipeline volumes increased while water carrier volumes decreased, so pipelines transported almost 225 percent more or 3.25 times the amount of oil by water carriers (Chart 1).
- Though overall production was declining, the share of crude oil transported by pipeline increased from about 54 percent to 71 percent reflecting, in part, the diminished requirement for coastal water carriers brought about by decreases in Alaskan crude oil production (Chart 2).

- In total, ton-miles of crude oil and petroleum products for all modes of transport have declined from 1.1 trillion ton-miles in 1990 to about 0.88 trillion ton-miles in 2008—an average annual rate of decline of 1.1 percent (Table 1).
- Motor carriers, while highly important and versatile for final disposition of petroleum, represent a smaller fraction of total ton-miles (about 4 percent). Motor carriers transport less than one-half of one percent of national crude oil movement but about 7 percent of petroleum products (Tables 1, 2, and 3). Railroads transport the smallest quantities of petroleum (2.6 percent in 2008). Railroads transport less than one-half of one percent of national crude oil movements but 4.6 percent of petroleum products (Tables 1, 2, and 3).

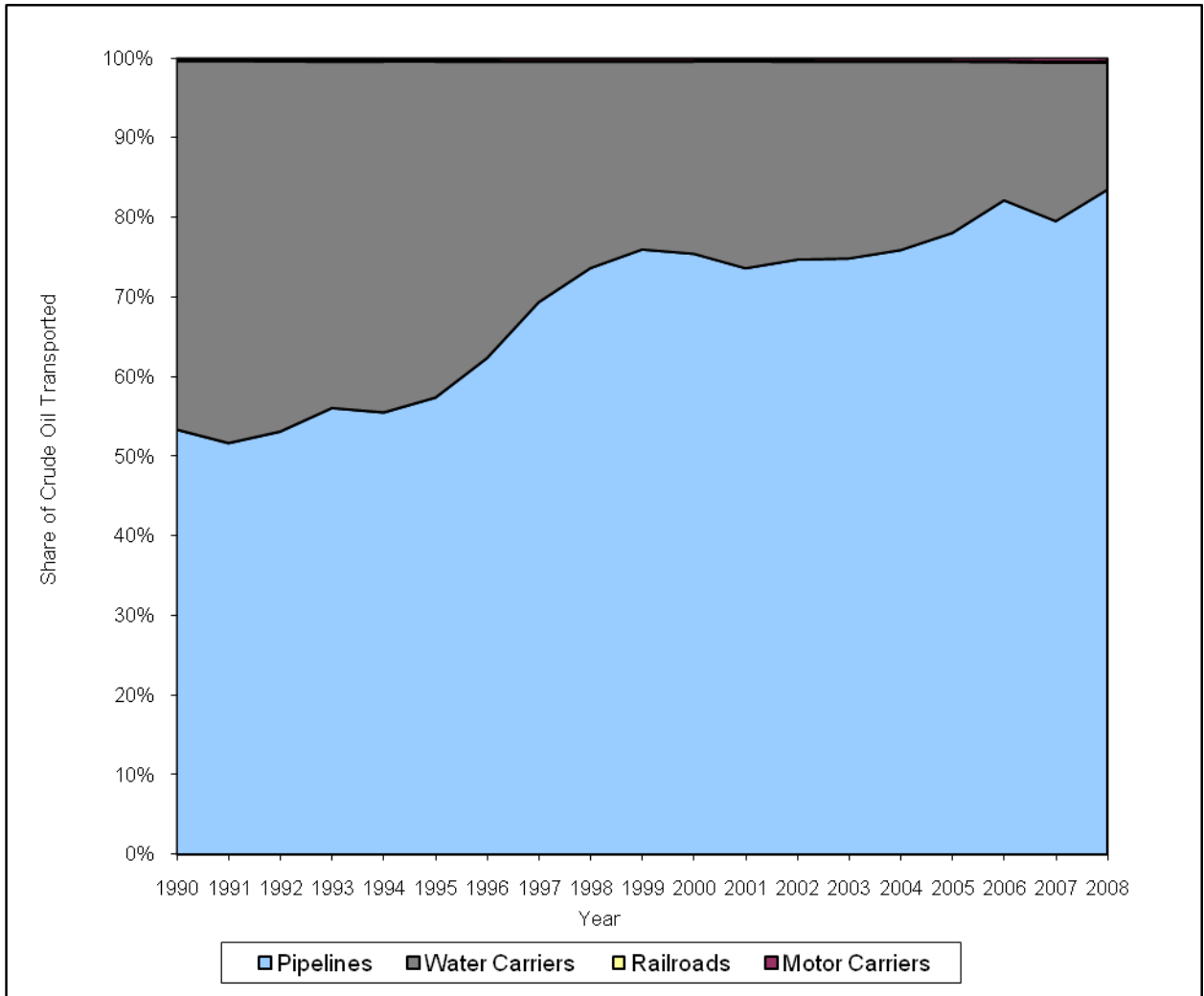
Data are in short ton-miles.¹ Table 1 contains data for total crude oil and petroleum product transportation. Table 2 contains data for crude oil. Table 3 contains data for petroleum products.

Chart 1: Share of Total Petroleum Transportation by Mode (1990-2008)



¹ A ton-mile is one ton of freight shipped one mile—a combined measure of both the weight shipped (short tons or 2,000 pound tons) and the distance (miles). Ton-miles in this report provide a common measure for considering the relative contribution and efficiency of the various modes of petroleum transportation. In addition, ton-miles can be useful in considering other variables such as safety and economic service. In order to express pipeline data (reported in barrel-miles) in ton-miles, conversion factors were developed based on data reported by the Energy Information Administration for crude oil gravity of refinery receipts and the weighted average gravity of refinery net output for products. For 2008, the crude oil conversion factor was 6.09 (barrels per short ton), while for products it was 7.16 (barrels per short ton).

Chart 2: Share of Crude Oil Transportation by Mode (1990-2008)



Note: Motor Carriers and Railroads together account for only 0.06 percent of crude oil transport ton-miles.

Statistical Time Series

Table 1—Total Crude Oil and Products Ton-miles (Billions of Ton-miles)

Year	Total Crude & Products	Pipelines		Water Carriers		Motor Carriers		Railroads	
	Ton Miles	Ton Miles	% of Total	Ton Miles	% of Total	Ton Miles	% of Total	Ton Miles	% of Total
1990	1076.8	584.1	54.2	449.0	41.7	29.7	2.8	14.0	1.3
1991	1086.1	578.5	53.3	465.0	42.8	28.8	2.7	13.8	1.3
1992	1091.7	588.8	53.9	459.3	42.1	28.8	2.6	14.8	1.4
1993	1034.6	592.9	57.3	401.7	38.8	27.8	2.7	15.2	1.5
1994	1046.7	591.4	56.5	411.4	39.3	28.1	2.7	15.8	1.5
1995	1044.9	601.1	57.5	400.9	38.4	26.3	2.5	16.7	1.6
1996	1022.2	619.2	60.6	356.5	34.9	29.7	2.9	16.8	1.6
1997	956.5	616.5	64.5	295.6	30.9	27.7	2.9	16.7	1.7
1998	929.8	619.8	66.7	265.0	28.5	28.3	3.0	16.7	1.8
1999	912.9	617.7	67.7	247.5	27.1	29.0	3.2	18.7	2.0
2000	873.3	577.3	66.1	244.4	28.0	31.3	3.6	20.3	2.3
2001	869.8	576.1	66.2	244.0	28.1	30.8	3.5	18.9	2.2
2002	864.6	586.2	67.8	227.6	26.3	30.6	3.5	20.2	2.3
2003	883.3	590.2	66.8	240.1	27.2	33.2	3.8	19.8	2.2
2004	902.5	599.6	66.4	246.9	27.4	34.4	3.8	21.6	2.4
2005	906.0	607.5	67.1	240.5	26.5	34.8	3.8	23.2	2.6
2006	855.4	581.3	68.0	213.1	24.9	35.2	4.1	25.8	3.0
2007	835.4	557.7	66.8	216.0	25.9	35.2	4.2	26.6	3.2
2008	882.2	629.9	71.4	194.0	22.0	35.1	4.0	23.0	2.6

Constant Annual Growth Rate (1990-2008)

Total All Modes:	-1.1%
Pipelines:	0.5%
Water Carriers:	-4.6%
Motor Carriers:	0.9%
Railroads:	2.8%

Year	Total Crude & Products	Pipelines		Water Carriers		Motor Carriers		Railroads	
	Ton Miles	Ton Miles	% of Total	Ton Miles	% of Total	Ton Miles	% of Total	Ton Miles	% of Total
2007	835.4	557.7	66.8	216.0	25.9	35.2	4.2	26.6	3.2
2008	882.2	629.9	71.4	194.0	22.0	35.1	4.0	23.0	2.6
Change 2007-2008	5.6%	12.9%	6.9%	-10.2%	-15.1%	-0.3%	-4.8%	-13.5%	-18.8%

Data sources and notes: See page 7. In 2006 there was a methodology change in the calculation of pipeline data (note 1), motor carrier data (note 3) and conversion of barrels to short tons (note 5). The data sources and methodology for water carriers and railroads did not change in this release.

Table 2—Total Crude Oil Ton-miles (Billions of Ton-miles)

Year	Total Crude	Pipelines		Water Carriers		Motor Carriers		Railroads	
	Ton Miles	Ton Miles	% of Total	Ton Miles	% of Total	Ton Miles	% of Total	Ton Miles	% of Total
1990	628.2	334.8	53.3	291.2	46.4	1.5	0.2	0.7	0.1
1991	651.3	336.1	51.6	312.8	48.0	1.6	0.2	0.8	0.1
1992	647.1	343.3	53.1	301.3	46.6	1.7	0.3	0.8	0.1
1993	586.9	328.7	56.0	255.5	43.5	1.8	0.3	0.9	0.2
1994	581.8	322.6	55.4	256.7	44.1	1.7	0.3	0.8	0.1
1995	586.0	335.9	57.3	247.7	42.3	1.7	0.3	0.8	0.1
1996	543.2	338.3	62.3	202.4	37.3	1.7	0.3	0.8	0.1
1997	486.9	337.4	69.3	147.3	30.3	1.7	0.3	0.5	0.1
1998	454.1	334.1	73.6	117.9	26.0	1.6	0.4	0.5	0.1
1999	423.0	321.1	75.9	100.0	23.6	1.4	0.3	0.5	0.1
2000	376.0	283.4	75.4	91.0	24.2	1.2	0.3	0.4	0.1
2001	376.6	277.0	73.6	98.1	26.0	1.1	0.3	0.4	0.1
2002	384.0	286.6	74.6	95.7	24.9	1.2	0.3	0.5	0.1
2003	380.4	284.5	74.8	94.1	24.7	1.3	0.3	0.5	0.1
2004	374.1	283.7	75.8	88.7	23.7	1.2	0.3	0.5	0.1
2005	376.3	293.5	78.0	81.1	21.5	1.4	0.4	0.4	0.1
2006	366.0	300.5	82.1	63.8	17.4	1.4	0.4	0.4	0.1
2007	335.5	266.6	79.5	66.9	19.9	1.6	0.5	0.4	0.1
2008	396.4	330.7	83.4	63.2	16.0	1.7	0.4	0.7	0.2

Constant Annual Growth Rate (1990-2008)

Crude All Modes:	-2.5%
Pipelines:	-0.1%
Water Carriers:	-8.1%
Motor Carriers	0.8%
Railroads	0.3%

Year	Total Crude	Pipelines		Water Carriers		Motor Carriers		Railroads	
	Ton Miles	Ton Miles	% of Total	Ton Miles	% of Total	Ton Miles	% of Total	Ton Miles	% of Total
2007	335.5	266.6	79.5	66.9	19.9	1.6	0.5	0.4	0.1
2008	395.4	330.7	83.4	63.2	16.0	1.7	0.4	0.7	0.2
Change 2007-2008	17%	24%	4.9%	-5.5%	-19.5%	6.25%	-20%	75%	~0%

Data sources and notes: See page 7. In 2006 there was a methodology change in the calculation of pipeline data (note 1), motor carrier data (note 3) and conversion of barrels to short tons (note 5). The data sources and methodology for water carriers and railroads did not change in this release.

Table 3—Total Petroleum Products Ton-miles (Billions of Ton-miles)

Year	Total Products	Pipelines		Water Carriers		Motor Carriers		Railroads	
	Ton Miles	Ton Miles	% of Total	Ton Miles	% of Total	Ton Miles	% of Total	Ton Miles	% of Total
1990	448.6	249.3	55.6	157.8	35.2	28.2	6.3	13.3	3.0
1991	434.8	242.4	55.7	152.2	35.0	27.2	6.3	13.0	3.0
1992	444.6	245.5	55.2	158.0	35.5	27.1	6.1	14.0	3.1
1993	447.7	264.2	59.0	146.2	32.7	26.0	5.8	14.3	3.2
1994	464.9	268.8	57.8	154.7	33.3	26.4	5.7	15.0	3.2
1995	458.9	265.2	57.8	153.2	33.4	24.6	5.4	15.9	3.5
1996	479.0	280.9	58.6	154.1	32.2	28.0	5.8	16.0	3.3
1997	469.6	279.1	59.4	148.3	31.6	26.0	5.5	16.2	3.4
1998	475.7	285.7	60.1	147.1	30.9	26.7	5.6	16.2	3.4
1999	489.9	296.6	60.5	147.5	30.1	27.6	5.6	18.2	3.7
2000	497.3	293.9	59.1	153.4	30.8	30.1	6.1	19.9	4.0
2001	493.2	299.1	60.6	145.9	29.6	29.7	6.0	18.5	3.8
2002	480.6	299.6	62.3	131.9	27.4	29.4	6.1	19.7	4.1
2003	502.9	305.7	60.8	146.0	29.0	31.9	6.3	19.3	3.8
2004	528.4	315.9	59.8	158.2	29.9	33.2	6.3	21.1	4.0
2005	529.7	314.0	59.3	159.4	30.1	33.4	6.3	22.8	4.3
2006	489.4	280.9	57.4	149.3	30.5	33.8	6.9	25.4	5.2
2007	499.9	291.1	58.2	149.1	29.8	33.5	6.7	26.2	5.2
2008	485.7	299.2	61.6	130.8	26.9	33.4	6.9	22.3	4.6

Constant Annual Growth Rate (1990-2008)

Product All Modes:	0.4%
Pipelines:	1.0%
Water Carriers:	-1.1%
Motor Carriers	1.0%
Railroads	2.9%

Year	Total Product	Pipelines		Water Carriers		Motor Carriers		Railroads	
	Ton Miles	Ton Miles	% of Total	Ton Miles	% of Total	Ton Miles	% of Total	Ton Miles	% of Total
2007	499.9	291.1	58.2	149.1	29.8	33.5	6.7	26.2	5.2
2008	485.7	299.2	61.6	130.8	26.9	33.4	6.9	22.3	4.6
Change 2007-2008	-2.8%	2.8%	5.84%	-12.3%	-9.7%	-0.29%	0.3%	-14.9%	-11.5%

Data sources and notes: See page 7. In 2006 there was a methodology change in the calculation of pipeline data (note 1), motor carrier data (note 3) and conversion of barrels to short tons (note 5). The data sources and methodology for water carriers and railroads did not change in this release.

The 1993 data for Motor Carrier Product Ton-Miles (in italics) is a statistical revision.

Data Sources and Notes:

Data Sources for Tables 1, 2, and 3:

1. Pipelines:

- Federal Energy Regulatory Commission Form No. 6, Page 600 (1990-2005 data).
- U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety, PHMSA F 7000-1-1 (Annual Reports for Calendar Years 2006, 2007; and 2008, Hazardous Liquid or Carbon Dioxide Systems).

2. Water Carriers:

- U.S. Army Corps of Engineers, annual report “Waterborne Commerce of the United States,” Part 5 (national summaries), Table 2-2 from ENG forms 3925 and 3925B.

3. Motor Carriers:

- U.S. Interstate Commerce Commission Annual Reports (1990-1994) and U.S. Department of Transportation, Federal Motor Carrier Safety Administration, Form M (1995-2004). Estimates for 2005 - 2008 were developed from Energy Information Administration data. See note 3 below.

4. Railroads:

- U.S. Department of Transportation, Surface Transportation Board and the Federal Railroad Administration, carload waybill samples and estimate of total – “Carload Way Bill Statistics, Report TD-1” and “Freight Commodity Statistics” of The Association of American Railroads annual statistics, Table A3.

Notes for Tables 1, 2, and 3:

1. Beginning with 2006 data, pipeline data were taken from PHMSA F 7000-1-1. Previously, data were extracted from FERC Form No. 6, which included data for federally-regulated pipelines. For 2005, data for federally regulated pipelines were estimated to include about 90 percent of the total national ton-miles, so the pipeline statistics for that year were adjusted to include an additional 10 percent of ton-miles. From 1990 through 2004, the federally regulated estimate was 84 percent with a 16 percent addition for other pipeline ton-miles.
2. Water carrier statistics include total trip statistics as reported by water carriers to the U.S. Army Corps of Engineers.
3. Motor carrier statistics for 1990-2004 include sample data of individual motor carriers representing the motor carrier industry. The data are from U.S. Interstate Commerce Commission (1990-1994) and the U.S. Department of Transportation, Federal Motor Carrier Safety Administration, Form M. Schedule 300 of Form M includes ton mile statistics. Form M reporting for ton miles was inadequate for estimating total motor carrier ton miles in 2005, 2006, and 2007. In place of Form M data, the Shift Report uses correlations between prior time series and U.S. Energy Information Administration (EIA) data for refinery crude oil receipts by truck, EIA oil product imports, and refinery and blending outputs to establish estimates of motor carrier transport in 2005 - 2007. Average hauls are estimated at 23 miles for crude oil and 57 miles for petroleum products. The average for all motor carrier transportation is 53 miles.
4. Railroad ton mile statistics use annual samples collected by the Federal Railroad Administration and estimated to annual totals.
5. Crude oil barrel to ton conversions for 2005 - 2007 use weighted average API gravities for crude oil receipts at refineries as reported by the Energy Information Administration. Petroleum product conversions for 2005 - 2007 use product-level conversion factors reported by the Energy Information Administration as reported on Table C1 of annual releases of the “International Energy Annual.”