Table 54. Air Travel Energy Use

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Fuel Cost (1987 dollars per million Btu)	4.2	4.5	5.6	5.3	4.8	4.5	4.5	4.4	4.3	4.3	4.3	4.3	4.3
Yield-domestic (ticket price) 1/	10.8	10.9	10.1	9.5	9.0	8.6	8.2	7.9	7.6	7.3	7.1	6.8	6.8
Yield-international (1996 dollars) 1/	8.9	9.0	8.6	8.3	8.0	7.7	7.4	7.1	6.9	6.6	6.4	6.1	5.9
Travel Demand (billion miles)													
Revenue Passenger Miles, Domestic	479.3	504.4	515.0	524.2	536.6	552.0	573.7	594.4	619.8	643.5	664.7	683.3	702.9
Load Factor, Domestic 2/	0.70	0.71	0.71	0.72	0.72	0.72	0.72	0.73	0.73	0.73	0.73	0.73	0.73
Revenue Passenger Miles, International	171.9	168.1	173.6	181.0	190.2	200.4	210.8	221.2	231.8	242.4	250.9	258.6	265.1
Load Factor, International 2/	0.76	0.75	0.76	0.76	0.77	0.77	0.77	0.77	0.78	0.78	0.78	0.78	0.78
Revenue Ton Miles, Freight (billion)	28.1	29.7	28.6	32.3	35.6	39.1	39.3	40.8	43.3	45.5	47.7	49.8	52.1
Seat Miles Demanded (billion)	907.8	932.3	950.9	969.9	996.4	1027.0	1067.0	1105.6	1152.3	1194.1	1231.4	1263.6	1295.7
Narrow Body Aircraft	560.0	577.0	588.3	596.6	609.7	625.3	647.2	667.9	695.3	718.7	739.8	758.8	777.6
Wide Body Aircraft	277.9	261.2	281.3	286.9	294.8	303.3	313.8	323.9	334.3	343.6	351.2	356.9	361.4
Regional Jets	69.9	94.1	81.4	86.3	91.9	98.4	106.0	113.8	122.7	131.7	140.4	147.9	156.8
Aircraft Sales													
Narrow Body Aircraft	164.0	98.0	221.6	234.1	238.0	243.8	241.3	241.9	239.7	236.7	235.6	238.2	243.0
Wide Body Aircraft	40.0	30.0	69.2	73.1	74.3	76.1	75.3	75.5	74.8	73.9	73.5	74.3	75.8
Regional Jets	281.0	303.0	124.6	131.6	133.8	137.1	135.7	136.0	134.8	133.1	132.5	134.0	136.7
Total Aircraft Sales	485.0	431.0	415.4	438.8	446.2	457.0	452.2	453.5	449.3	443.7	441.6	446.5	455.5
Aircraft Stock													
Narrow Body Aircraft	5002.0	4894.0	5080.4	5171.6	5269.2	5375.1	5481.2	5590.2	5698.6	5804.9	5908.9	6013.7	6124.9
Wide Body Aircraft	1373.0	1394.0	1403.1	1434.3	1463.8	1492.5	1517.9	1541.4	1563.8	1585.6	1608.2	1631.9	1658.0
Regional Jets	1290.0	1586.0	1408.8	1533.9	1660.2	1788.9	1915.1	2040.5	2163.4	2283.3	2401.7	2520.1	2639.4
Total Aircraft Stock	7665.0	7874.0	7892.3	8139.7	8393.3	8656.5	8914.2	9172.0	9425.7	9673.8	9918.8	10165.8	10422.3
Aircraft Active Stock													
Narrow Body Aircraft	4167.0	3785.0	3908.9	3993.8	4068.6	4160.1	4291.6	4414.7	4581.1	4720.6	4776.0	4823.8	4878.4
Wide Body Aircraft	1133.0	762.0	724.3	739.9	761.4	784.6	813.4	846.9	884.4	924.2	965.4	1008.5	1053.1
Regional Jets	1214.0	1214.0	1408.8	1516.8	1598.4	1678.9	1773.8	1875.8	1990.6	2105.4	2215.2	2304.8	2413.1
Total Active Stock	6514.0	5761.0	6042.0	6250.5	6428.4	6623.6	6878.8	7137.4	7456.2	7750.1	7956.7	8137.2	8344.6
Aircraft Parked Stock													
Narrow Body Aircraft	835.0	668.0	0.0	14.1	51.5	97.9	99.2	109.7	54.9	2.2	0.0	0.0	0.0
Wide Body Aircraft	240.0	187.0	148.7	162.6	171.5	187.0	195.7	205.5	210.7	210.2	210.3	203.0	200.2
Regional Jets	76.0	76.0	0.0	17.1	61.8	110.0	141.3	164.7	172.8	177.8	186.5	215.3	226.3
Total Parked Stock	1151.0	931.0	148.7	193.7	284.9	394.9	436.2	479.9	438.3	390.3	396.7	418.3	426.5
Aircraft Cargo Stock													
Narrow Body Aircraft	549.0	549.0	1171.4	1163.6	1149.1	1117.1	1090.4	1065.7	1062.6	1082.1	1132.9	1189.9	1246.6
Wide Body Aircraft	424.0	424.0	530.2	531.8	530.9	520.9	508.9	489.0	468.6	451.3	432.5	420.4	404.7
Total Cargo Stock	973.0	973.0	1701.6	1695.5	1680.0	1638.0	1599.2	1554.8	1531.2	1533.4	1565.4	1610.3	1651.3
Advanced Technology Penetration													
Ultra-high Bypass	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.05	0.11	0.20	0.34
Propfan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thermodynamics	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hybrid Laminar Flow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Advanced Aerodynamics	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weight Reducing Materials	0.00	0.00	0.01	0.02	0.04	0.08	0.14	0.25	0.40	0.57	0.73	0.85	0.92
New Aircraft Efficiency 3/													
Narrow Body Aircraft	63.9	64.6	64.8	64.9	65.1	65.5	66.2	67.3	68.8	70.7	72.5	74.3	75.8
Wide Body Aircraft	62.3	63.0	63.2	63.3	63.5	63.9	64.6	65.7	67.2	69.0	70.9	72.6	74.1
Regional Jets	42.1	42.7	42.8	42.9	43.0	43.2	43.7	44.4	45.4	46.6	47.9	49.0	50.0

Table 54. Air Travel Energy Use

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Average Aircraft	61.9	58.1	57.7	57.6	57.6	57.8	58.3	59.1	60.3	61.8	63.3	64.7	65.8
Aircraft Stock Efficiency 3/													
Narrow Body Aircraft	57.2	56.7	58.4	59.1	59.7	60.3	60.8	61.3	61.8	62.4	63.1	63.9	64.7
Wide Body Aircraft	56.2	55.9	57.8	58.8	59.7	60.6	61.3	62.0	62.7	63.4	64.1	64.8	65.6
Regional Jets	41.3	41.2	41.2	41.5	41.7	41.9	42.0	42.2	42.5	42.7	43.1	43.4	43.8
Average Aircraft	55.2	55.3	56.2	56.9	57.4	57.9	58.4	58.8	59.2	59.6	60.2	60.8	61.4
Fuel Consumption (trillion Btu)													
Commercial													
Jet Fuel	2825.3	2702.2	2801.8	2883.9	2979.7	3088.4	3162.0	3255.0	3383.3	3492.8	3582.0	3653.5	3725.7
Aviation Gasoline	42.5	42.3	42.3	42.3	42.2	42.2	42.2	42.2	42.1	42.1	42.1	42.1	42.1
Military													
Jet Fuel	514.7	554.8	621.8	642.2	649.9	651.4	652.5	653.5	653.5	654.0	654.7	655.4	656.4

Table 54. Air Travel Energy Use

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2003-2025
Fuel Cost (1987 dollars per million Btu)	4.3	4.4	4.4	4.4	4.5	4.5	4.6	4.7	4.7	4.8	4.8	0.3%
Yield-domestic (ticket price) 1/	6.8	6.8	6.8	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	-2.2%
Yield-international (1996 dollars) 1/	5.7	5.7	5.7	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	-2.2%
Travel Demand (billion miles)												
Revenue Passenger Miles, Domestic	721.9	737.9	754.0	768.0	780.3	790.2	799.8	807.6	814.2	820.7	825.2	2.3%
Load Factor, Domestic 2/	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.75	0.75	0.75	0.75	0.2%
Revenue Passenger Miles, International	271.7	279.7	287.6	295.1	302.4	309.2	315.9	321.7	326.7	330.9	334.1	3.2%
Load Factor, International 2/	0.78	0.79	0.79	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.80	0.3%
Revenue Ton Miles, Freight (billion)	54.1	55.8	58.2	61.2	64.1	66.6	69.0	71.5	74.4	77.3	80.2	4.6%
Seat Miles Demanded (billion)	1327.4	1356.3	1385.6	1410.9	1435.2	1454.5	1473.2	1488.7	1501.3	1513.4	1520.4	2.2%
Narrow Body Aircraft	795.6	811.7	827.1	839.9	852.1	861.4	869.7	876.5	881.2	886.9	884.3	2.0%
Wide Body Aircraft	366.0	370.3	375.4	379.6	383.4	385.6	388.2	389.8	390.4	390.1	392.7	1.9%
Regional Jets	165.7	174.4	183.1	191.5	199.8	207.6	215.3	222.4	229.7	236.4	243.4	4.4%
Aircraft Sales												
Narrow Body Aircraft	244.7	246.3	250.2	255.2	259.5	264.8	269.8	276.8	284.9	292.6	301.4	5.2%
Wide Body Aircraft	76.4	76.9	78.1	79.7	81.0	82.7	84.2	86.4	88.9	91.3	94.1	5.3%
Regional Jets	137.6	138.5	140.7	143.5	145.9	148.9	151.7	155.7	160.2	164.5	169.5	-2.6%
Total Aircraft Sales	458.6	461.7	469.1	478.4	486.4	496.4	505.7	518.9	534.0	548.5	564.9	1.2%
Aircraft Stock												
Narrow Body Aircraft	6241.3	6359.8	6477.8	6595.3	6711.4	6828.1	6945.6	7066.4	7191.8	7321.4	7457.6	1.9%
Wide Body Aircraft	1685.6	1713.1	1741.0	1769.6	1799.5	1831.9	1866.7	1903.5	1943.4	1985.3	2029.1	1.7%
Regional Jets	2757.5	2874.2	2990.5	3106.9	3222.7	3338.3	3453.0	3567.9	3683.1	3798.3	3913.6	4.2%
Total Aircraft Stock	10684.3	10947.1	11209.3	11471.8	11733.6	11998.2	12265.3	12537.8	12818.3	13105.0	13400.3	2.4%
Aircraft Active Stock												
Narrow Body Aircraft	4930.2	4989.4	5056.6	5169.7	5313.2	5471.9	5546.3	5573.6	5588.2	5609.2	5577.6	1.8%
Wide Body Aircraft	1096.5	1136.8	1173.2	1205.7	1234.5	1261.1	1286.1	1310.2	1333.1	1354.8	1376.4	2.7%
Regional Jets	2520.7	2622.6	2724.5	2819.1	2912.6	2996.8	3078.8	3153.0	3227.0	3293.1	3361.6	4.7%
Total Active Stock	8547.5	8748.8	8954.4	9194.5	9460.3	9729.8	9911.2	10036.7	10148.3	10257.2	10315.6	2.7%
Aircraft Parked Stock												
Narrow Body Aircraft	0.0	0.0	0.0	0.0	0.0	0.0	100.4	252.8	372.5	423.5	514.3	-1.2%
Wide Body Aircraft	202.0	203.1	203.1	210.3	234.0	264.1	295.9	324.1	349.2	363.5	375.7	3.2%
Regional Jets	236.8	251.6	266.0	287.8	310.2	341.4	374.2	414.9	456.1	505.1	552.0	9.4%
Total Parked Stock	438.8	454.7	469.1	498.1	544.2	605.5	770.5	991.8	1177.8	1292.2	1442.1	2.0%
Aircraft Cargo Stock												
Narrow Body Aircraft	1311.1	1370.4	1421.2	1425.6	1398.2	1356.2	1298.9	1240.0	1231.1	1288.7	1365.7	4.2%
Wide Body Aircraft	387.0	373.2	364.7	353.6	330.9	306.7	284.6	269.3	261.1	267.0	276.9	-1.9%
Total Cargo Stock	1698.1	1743.6	1785.9	1779.2	1729.1	1662.9	1583.5	1509.3	1492.1	1555.7	1642.6	2.4%
Advanced Technology Penetration												
Ultra-high Bypass	0.51	0.69	0.83	0.91	0.96	0.98	0.99	1.00	1.00	1.00	1.00	31.4%
Propfan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
Thermodynamics	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
Hybrid Laminar Flow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
Advanced Aerodynamics	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
Weight Reducing Materials	0.96	0.98	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	27.3%
New Aircraft Efficiency 3/												
Narrow Body Aircraft	77.3	78.7	79.7	80.3	80.7	80.8	80.9	80.9	80.9	80.9	80.9	1.0%
Wide Body Aircraft	75.6	77.0	78.0	78.6	79.0	79.1	79.2	79.3	79.3	79.4	79.4	1.1%
Regional Jets	51.0	52.0	52.6	53.0	53.2	53.3	53.4	53.4	53.4	53.4	53.4	1.0%

Table 54. Air Travel Energy Use

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2003-2025
Average Aircraft	67.0	68.0	68.7	69.2	69.4	69.6	69.6	69.5	69.4	69.3	69.1	0.8%
Aircraft Stock Efficiency 3/												
Narrow Body Aircraft	65.6	66.5	67.4	68.2	69.0	69.7	70.5	71.4	72.3	73.2	74.2	1.2%
Wide Body Aircraft	66.4	67.2	68.1	69.0	69.9	70.8	71.7	72.5	73.4	74.3	75.1	1.4%
Regional Jets	44.2	44.6	45.0	45.4	45.8	46.2	46.6	47.0	47.5	47.9	48.3	0.7%
Average Aircraft	62.1	62.7	63.4	64.0	64.6	65.2	65.9	66.5	67.2	67.9	68.5	1.0%
Fuel Consumption (trillion Btu)												
Commercial												
Jet Fuel	3790.0	3840.6	3901.1	3964.7	4026.1	4071.2	4106.9	4137.2	4166.3	4194.7	4211.8	2.0%
Aviation Gasoline	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	0.0%
Military												
Jet Fuel	658.3	660.9	663.3	665.5	667.5	669.4	671.2	672.8	674.4	675.9	677.3	0.9%

Table 54. Air Travel Energy Use

1/ Fraction of seats filled.
2/ 1992 cents per passenger mile.
3/ Seat miles per gallon.
Btu = British thermal unit.
N/A = Not applicable.
Sources: 2003 derived using: Decision Analysis Corporation of Virginia, NEMS Transportation Sector Model: Model Maintenance Re-Estimation of the Air Travel Demand Model, Subtask 22-1(a), (September 30, 1997); Federal Aviation Administration (FAA), FAA Aviation Forecasts, Fiscal Years 1998-2009, FAA-APO 98-1, and previous editions; United States Department of Transportation (DOT), Research and Special Programs Administration (RSPA), Fuel Cost and Consumption Tables, annual summaries, 1979-1990; U.S. Department of Transportation, RSPA, Air Carrier Financial Statistics Quarterly, December 1999/1998; U.S. Department of Transportation, RSPA, Air Carrier Statistics Monthly, December 1999/1998 (Washington, DC, 1999); Greene, D.L., "Energy Efficiency Improvement Potential of Commercial Aircraft to 2010," ORNL-6622, 6/1990; Rathi, A. B. Peterson, and D. Greene, Air Transport Energy Use Model, Oak Ridge National Laboratory, April 1991, Draft; Energy Information Administration (EIA), State Energy Data 2001, DOE/EIA-0214(2001) (Washington, DC, November 2004); Department of Defense, Defense Energy Support Center, Fact Book: Fiscal Year 1999; and EIA, AEO2005 National Energy Modeling System run aeo2005.d102004a. Projections: EIA AEO2005 National Energy Modeling System run aeo2005.d102004a.