A Comparison of energy consumption of Cars, Tranist Buses Rail and air.

Based of data found in:

The transportation Energy Data Book: Edition 25 - 2006 ,

a publication prepared for the U.S. department of energy
by the Oak Ridge National Labratory

Energy consumption of car-bus-air compared

Table 2.10 lists energy consumption of various modes of passenger travel. It shows that cars use less energy than rail, transit bus or commercial air. Here are the numbers from table 2.10 and from below:

mode	btu/passenger mile	
Car, hybrid	1,326	(Honda Insight-see below)
Van Pool	1,401	(National average)
Car, efficinet	2,488	(2006 KIA Rio-see below)
Commuter rail	2,751	
Amtrak	2,935	Amtrak
Light & heavy rail tranist	3,228	Light rail & heavy rail tranist
Car, average	3,549	(National average)
TriMet bus	3,792	(Data directly from TriMet)
Commerical air	3,587	(see note in link)
Transit bus	4,160	(National average)

The car number is an average based on the average current fleet and an average number of passengers. More efficient cars are readily available, for instance the $10,770, 2006 KIA Rio is listed at 32 MPG city. This is 3906 btu/vehicle-mile, or 2488 btu per passenger-mile usning 1.57 passengers per vehicle, only 60% as much energy as atransit bus.

For Portland where we drive alone more, the passengers per vehicle is about 1.3, so the following apply: With an average of 1.3 passengers, the 2006 KIA Rio becomes 3004 btu per passenger mile which is 26% less energy than Trimet busses per passenger mile. The Honda Insight at 60 MPG city is 2083 btu per vehicle mile (1602 per passenger-mile@1.3passengers), uses less then one-half the energy of a Trimet bus. At two passengers it consumes only 1042 btu per passenger mile - less than 1/3 that of a Trimet bus.

Do high density cities have lower transit energy consumption than the average?

No. See Figurre 2.2.

Why do people think that transit buses save energy?

Because they did in 1970, but over the years, buses became less efficient and cars more efficient. See table 2.11

What about using Europe as a model, they all take transit don't they?

Figure 3.1 shows vehicles per 1000 people from 1940 to present. It also shows European vehicles per 1000 at two points in time, 1994 and 2004. Viewing the chart, the U.S. has about 750 vehicles per 1000 people while Europe has about 560, or about 75% as many. Interestingly, Europeans have about 75% as much income as we do. They also pay a lot more for fuel.

Conclusion

The most practical way to reduce transport energy consumption is to encourage people to switch to small cars. It will save more energy than transit and is more likely to succeed.

For more information & details see: wwwDebunkingPortland.com

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Great care should be taken when comparing modal energy intensity data among modes. Because of the inherent differences among the transportation modes in the nature of services, routes available, and many additional factors, it is not possible to obtain truly comparable national energy intensities among modes. These values are averages, and there is a great deal of variability even within a mode.

Table 2.10
Passenger Travel and Energy Use, 2003

					Energy intensities		
	Number of vehicles (thousands)	Vehicle-miles (millions)	Passenger-miles (millions)	Load factor (persons/ vehicle)	(Btu per vehicle-mile)	(Btu per passenger-mile)	Energy use (trillion Btu)
Cars	**135,669.9**	**1,660,828**	**2,607,547**	**1.57**	**5,572**	**3,549**	**9,254.7**
Personal trucks [a]	**76,627.3**	**835,666**	**1,437,346**	**1.72**	**6,894**	**4,008**	**5,760.9**
Motorcycles	**5,370.0**	**9,539**	**11,638**	**1.22**	**2,500**	**2,049**	**23.8**
Demand response[b]	**36.0**	**864**	**930**	**1.1**	**21,319**	**19,806**	**18.4**
Vanpool	**6.6**	**89**	**541**	**6.1**	**8,489**	**1,401**	**0.8**
Buses	[c]	[c]	[c]	[c]	[c]	[c]	**186.8**
Transit	78.0	2,435	21,262	8.7	36,628	4,160	89.2
Intercity[d]	[c]	[c]	[c]	[c]	[c]	[c]	28.3
School[d]	631.4	[c]	[c]	[c]	[c]	[c]	69.3
Air	[c]	[c]	[c]	[c]	[c]	[c]	**2,217.3**
Certificated route[e]	[c]	[c]	578,745	[c]	[c]	3,587	2,075.9
General aviation	209.7	[c]	[c]	[c]	[c]	[c]	141.4
Recreational boats	**12,665.0**	[c]	[c]	[c]	[c]	[c]	**203.6**
Rail	**18.6**	**1,311**	**30,321**	**23.1**	**69,947**	**3,024**	**91.7**
Intercity (Amtrak)	0.4	331	5,680	17.2	50,453	2,935	16.7
Transit (light & heavy)	12.2	694	15,082	21.7	70,173	3,228	48.7
Commuter	6.0	286	9,559	33.4	91,958	2,751	26.3

Source:
See Appendix A for Passenger Travel and Energy Use.

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[a] Changed significantly due to newly available data from the 2002 Vehicle Inventory and Use Survey. See Appendix A for details.

[b] Includes passenger cars, vans, and small buses operating in response to calls from passengers to the transit operator who dispatches the vehicles.

[c] Data are not available.

[d] Energy use is estimated.

[e] Includes domestic scheduled services and ½ of international scheduled services (Table 2.13 shows only domestic services). These energy intensities may be inflated because all energy use is attributed to passengers–cargo energy use is not taken into account.

up to $24,999

Showing **1** to of 310 pre ious | next >
1077 trims when expanded

Check up to 4 vehicles to compare side by side

	Photo	Model	MSRP	Engine	Fuel Economy
16.	 Compare	8 trims found for this model. +VIEW 2007 Honda Civic Coupe D 5-Spd AT	$15,610	140 HP 1. L I4	30/40 MPG
17.	 Compare	8 trims found for this model. +VIEW 2007 Honda Civic Sedan D 5-Spd AT	$15,810	140 HP 1. L I4	30/40 MPG
18.	 Compare	3 trims found for this model. +VIEW 2006 ia Rio Base	$10,770	110 HP 1.6L I4	32/35 MPG
19.	 Compare	2006 Hyundai Accent GLS	$12,455	110 HP 1.6L I4	32/35 MPG
20.	 Compare	3 trims found for this model. +VIEW 2007 Hyundai Accent GS 3-Door	$10,415	110 HP 1.6L I4	32/35 MPG
21.	 Compare	3 trims found for this model. +VIEW 2006 Pontiac Vibe Base	$16,430	126 HP 1. L I4	30/36 MPG

Modify This Search

Preferred Makes:
No Preference
No Preference
No Preference

Category - keep existing choices or select a new category:
Keep existing

Year:
Any

Price:
$0 to
Any

Search

up to $24,999

Showing **1** to **15** of 310 next >
1077 trims when expanded

Check up to 4 vehicles to compare side by side

	Photo	Model	MSRP	Engine	Fuel Economy
1.	 Compare	3 trims found for this model. +VIEW 2006 Honda Insight 5-Spd MT	$19,330	73 HP 1.0L I3	60/66 MPG
2.	 Compare	2006 Toyota Prius 4-Door Liftback	$21,725	110 HP 1.5L I4	60/51 MPG
3.	 Compare	2 trims found for this model. +VIEW 2007 Toyota Prius 4-Door Liftback	$22,175	110 HP 1.5L I4	60/51 MPG
4.	 Compare	2 trims found for this model. +VIEW 2006 Honda Civic Hybrid CVT AT-PZEV	$22,150	110 HP 1.3L I4	49/51 MPG
5.	 Compare	2 trims found for this model. +VIEW 2007 Honda Civic Hybrid CVT AT-PZEV	$22,600	110 HP 1.3L I4	49/51 MPG
6.	 Compare	3 trims found for this model. +VIEW 2006 Volkswagen New Beetle TDI	$18,390	100 HP 1.9L I4	37/44 MPG

Modify This Search

Preferred Makes:

No Preference

No Preference

No Preference

Category - keep existing choices or select a new category:

Keep existing

Year:

Any

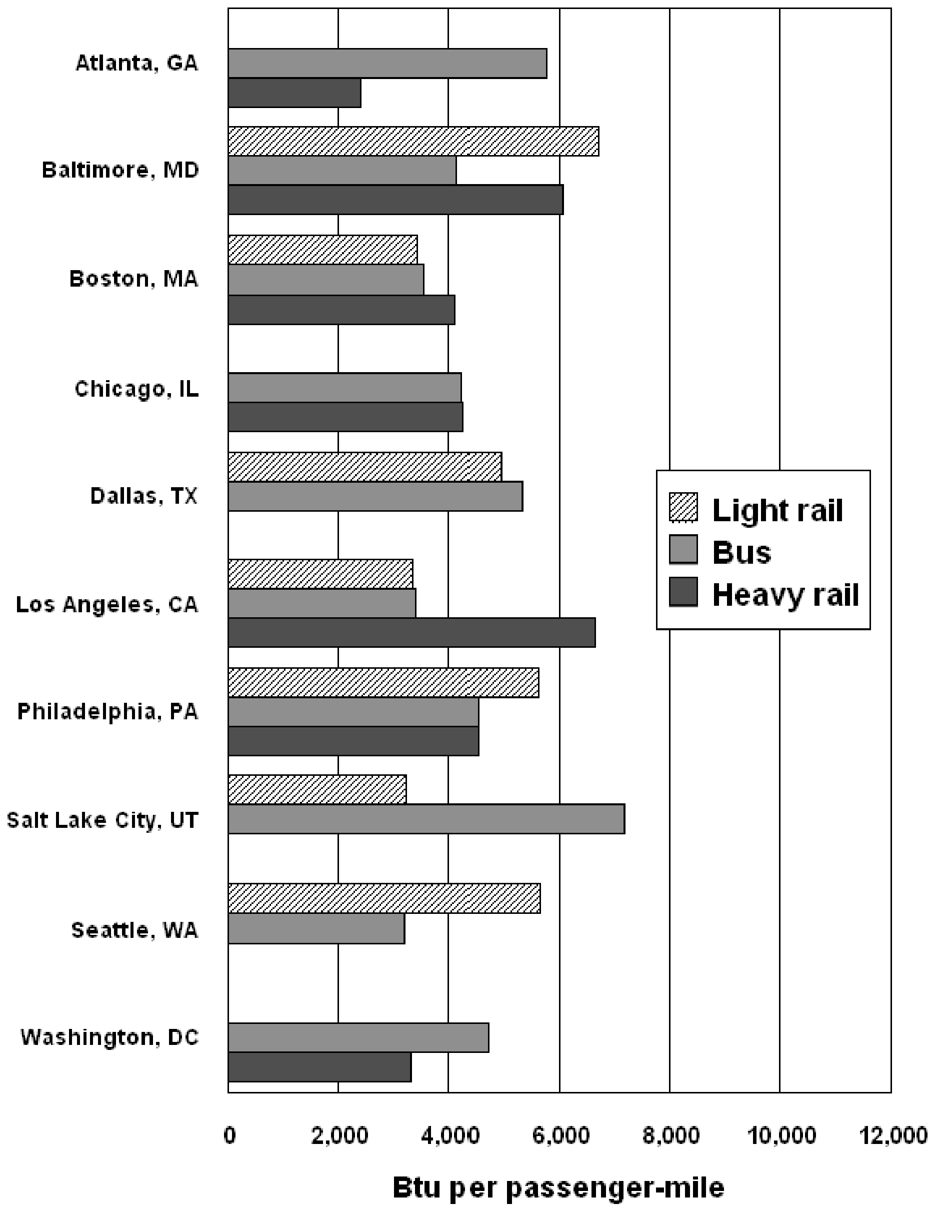
Price:

$0 to

Any

Search

Figure 2.2. Energy Intensities for Selected Transit Systems, 2003



Source:
U.S. Department of Transportation, Federal Transit Administration, 2003 National Transit Databases, Washington, DC. (Additional resources: www.fta.dot.gov/ntl)

Great care should be taken when comparing modal energy intensity data among modes. Because of the inherent differences among the transportation modes in the nature of services, routes available, and many additional factors, it is not possible to obtain truly comparable national energy intensities among modes. These values are averages, and there is a great deal of variability even within a mode.

Table 2.11
Energy Intensities of Highway Passenger Modes, 1970–2003

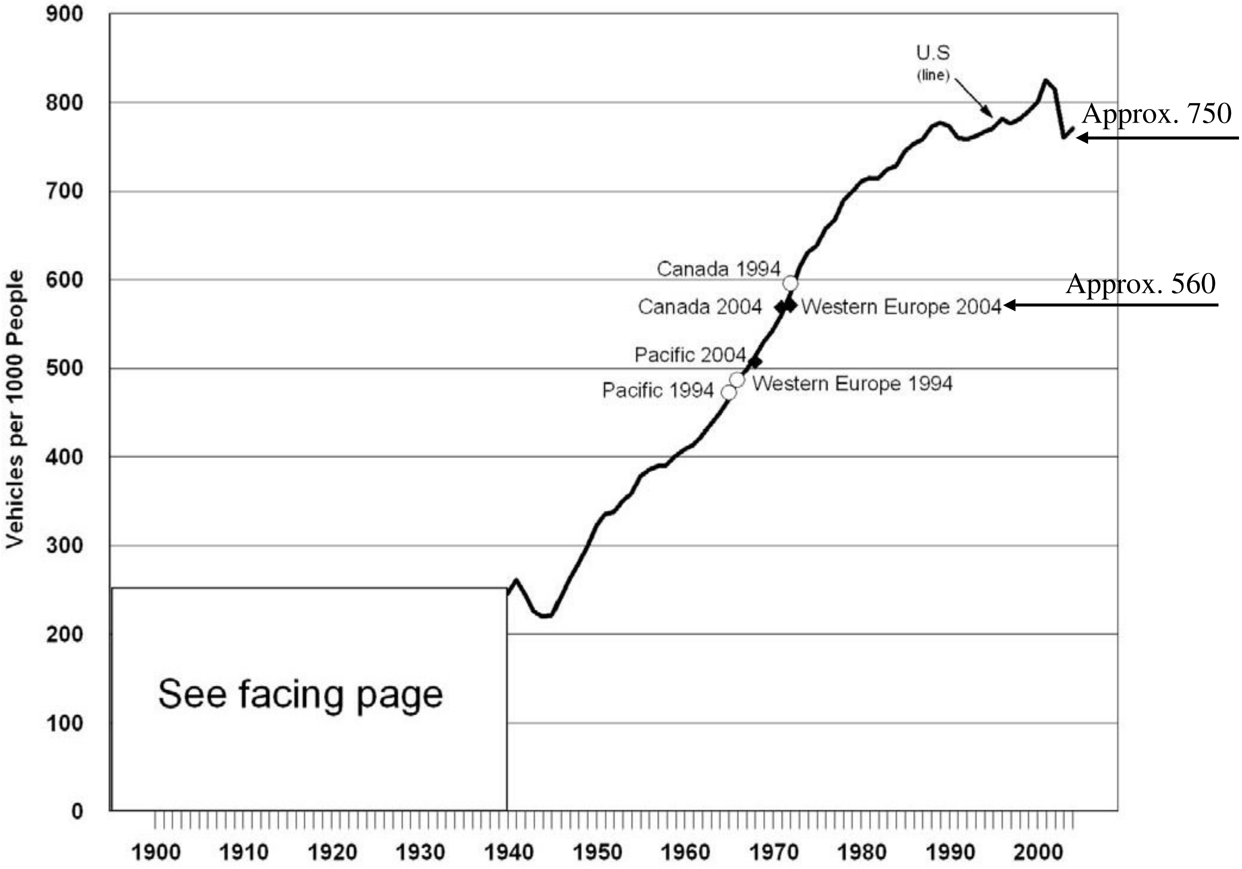
				Buses		
	Cars			Transit[b]		
Year	(Btu per vehicle-mile)	(Btu per passenger-mile)	Light truck[a] (Btu per vehicle-mile)	(Btu per vehicle-mile)	(Btu per passenger-mile)	Intercity (Btu per passenger-mile)
1970	9,250	4,868	12,479	31,796	2,472	1,674
1975	8,993	4,733	11,879	33,748	2,814	988
1976	9,113	4,796	11,523	34,598	2,896	1,007
1977	8,950	4,710	11,160	35,120	2,889	970
1978	8,839	4,693	10,807	36,603	2,883	976
1979	8,647	4,632	10,467	36,597	2,795	1,028
1980	7,916	4,279	10,224	36,553	2,813	1,082
1981	7,670	4,184	9,997	37,745	3,027	1,051
1982	7,465	4,109	9,268	38,766	3,237	1,172
1983	7,365	4,092	9,124	37,962	3,177	1,286
1984	7,202	4,066	8,931	38,705	3,307	954
1985	7,164	4,110	8,730	38,876	3,423	964
1986	7,194	4,197	8,560	37,889	3,545	870
1987	6,959	4,128	8,359	36,247	3,594	940
1988	6,683	4,033	8,119	36,673	3,706	963
1989	6,589	4,046	7,746	36,754	3,732	964
1990	6,169	3,856	7,746	37,374	3,794	962
1991	5,912	3,695	7,351	37,732	3,877	963
1992	5,956	3,723	7,239	40,243	4,310	964
1993	6,087	3,804	7,182	39,043	4,262	962
1994	6,024	3,765	7,212	37,313	4,268	964
1995	5,902	3,689	7,208	37,277	4,310	964
1996	5,874	3,683	7,247	37,450	4,340	963
1997	5,797	3,646	7,251	38,832	4,431	963
1998	5,767	3,638	7,258	41,182	4,387	963
1999	5,821	3,684	7,324	40,460	4,332	964
2000	5,687	3,611	7,154	41,548	4,515	932
2001	5,626	3,583	7,074	38,341	4,125	[c]
2002	5,662	3,607	7,117	37,492	4,127	[c]
2003	5,572	3,549	7,004	36,628	4,160	[c]
			Average annual percentage change			
1970–2003	-1.5%	-1.0%	-1.7%	0.4%	1.6%	[c]
1993–2003	-0.9%	-0.7%	-0.3%	-0.6%	-0.2%	[c]

Source:
See Appendix A for Highway Passenger Mode Energy Intensities.

[a] All two-axle, four-tire trucks.
[b] Series not continuous between 1983 and 1984 because of a change in data source by the American Public Transit Association (APTA).
[c] 2001 data are not yet available.

The graphs below show the number of motor vehicles per thousand people for various countries. The data for the U.S. are displayed in the line which goes from 1900 to 2004. The points labeled on that line show data for the other countries/regions around the world and how their vehicles per thousand people compare to the U.S. at two different points in time, 1994 and 2004. For instance, the top graph shows that in 1994, Western Europe's vehicles per thousand people was about where the U.S. was in 1966, but by 2004 it is about where the U.S. was in 1972. The lo wer part of the graph (1900-1940) is shown enlarged on the facing page.

Figure 3.1. Vehicles per Thousand People: U.S. (Over Time) Compared to Other Countries (in 1994 and 2004)



btu per Passenger Mile (gasolene at 125,000 btu/gal)

Transit Bus= 4160 national average, TriMet Bus=3792

	Number of Passengers							
MPG	1.0	1.2	1.4	1.6	1.8	2.0	3.0	4.0
5								
10	12500	10417	8929	7813	6944	6250	4167	3125
15	8333	6944	5952	5208	4629	4167	2778	2083
20	6250	5208	4464	3906	3472	3125	2083	1563
25	5000	4166	3571	3125	2778	2500	1667	1250
30	4167	3472	2976	2604	2315	2083	1389	1042
35	3571	2976	2551	2232	1984	1786	1190	893
40	3125	2604	2232	1953	1736	1563	1042	781
45	2777	2314	1984	1736	1543	1389	926	694
50	2500	2083	1786	1563	1389	1250	833	625
55	2273	1894	1623	1420	1263	1136	758	568
60	2083	1736	1488	1302	1157	1042	694	521
65	1923	1603	1374	1202	1068	962	641	481
70	1785	1488	1276	1116	992	893	595	446
75	1667	1389	1190	1042	926	833	556	417
80	1562	1302	1116	977	868	781	521	391

Entries below this line use less energy than transit buses