

February 2008

**Trends in  
Regional  
Traffic Volumes**

---

# **Signs of Change?**



**EAST-WEST GATEWAY**  
Council of Governments

Creating Solutions Across Jurisdictional Boundaries



## Trends in Regional Traffic Volumes: Signs of Change?

### Introduction

The total number of miles driven by all vehicles is referred to as Vehicle Miles Traveled, or VMT. The total traffic volume in a region is an important factor to consider in deciding when, where and whether new roads, or additional lanes on existing roads, need to be built. Moreover, since gasoline taxes constitute the principal source of funding for transportation projects, changes in VMT can significantly affect transportation financing. For these reasons, it is important for transportation planners to be able to forecast VMT trends.

In the past few decades, there has been a dramatic increase in VMT, both in the US and in the St. Louis area. However, recent evidence indicates that VMT is no longer growing, or at least that it is no longer growing as rapidly. To be sure, there are local "hot spots" where traffic volume does continue to increase. However, these high volume areas are not representative of the entire region.

Social and demographic factors that affect VMT include the age of the population, household size, labor force participation and car ownership. This report summarizes recent trends in VMT growth and in the factors that affect VMT growth.

## VMT Trends

Table 1 below shows that nationally, the rate of growth in VMT has fallen sharply since 2000. From 1982 to 2000, the average annual rate of growth in the US was 3.2 percent. Since 2000, the growth rate has been cut in half. In 2006, the growth rate was a miniscule 0.6 percent. Chart 1 shows that there have been previous periods in which growth rates temporarily leveled off, most notably during the economic slump of 1990-91. As discussed below however, there are reasons to believe that the current leveling off in VMT growth may be a long-term trend. Chart 2 shows a similar trend for urban traffic nationally.

Table 2 shows that a similar pattern has been observed in the St. Louis area, with a modest decrease in VMT seen in 2005. The average annual rate of growth in VMT was 3.8 percent for the period 1982-1998. From 1998 to 2005, the average rate of growth was just 0.6 percent. Chart 3 presents these figures graphically.

Data for the year 2007 have not yet been processed. However, the Federal Highway Administration (FHWA) reported that as of October, "cumulative travel for 2007 changed by 0.0 percent" nationwide, compared to the first ten months of 2006.

**Table 2:**  
**Average Annual Daily Vehicle Miles Traveled, EWG Region**

Year	Miles	Year	Miles
1970	27,346,988	1988	50,425,590
1971	28,159,798	1989	53,014,608
1972	29,659,260	1990	54,751,026
1973	31,149,775	1991	55,411,345
1974	29,472,602	1992	57,281,606
1975	31,325,308	1993	59,271,185
1976	33,166,947	1994	61,934,978
1977	34,599,809	1995	63,759,719
1978	35,363,651	1996	64,959,535
1979	36,438,300	1997	66,447,197
1980	35,907,078	1998	67,288,592
1981	36,388,830	1999	67,335,905
1982	37,211,706	2000	67,501,182
1983	40,269,224	2001	68,084,456
1984	42,693,821	2002	69,318,653
1985	43,491,733	2003	70,072,589
1986	46,263,500	2004	70,726,927
1987	47,860,288	2005	69,983,917

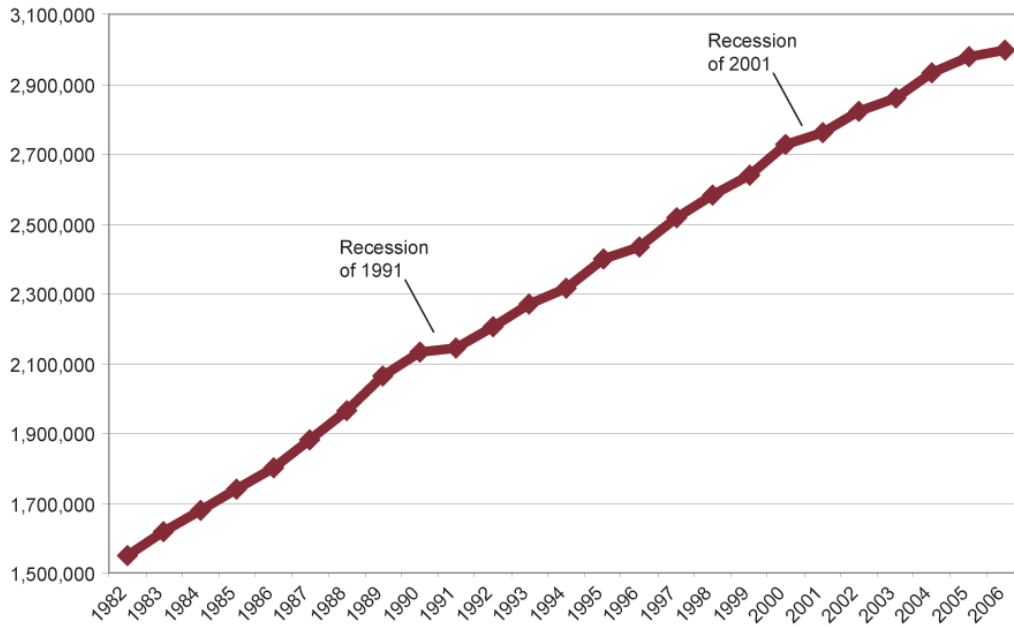
Source: East-West Gateway Council of Governments

**Table 1:**  
**Travel in Annual Vehicle Miles (millions), All Roads and Streets, US**

Year	VMT	Annual Percent Growth Rate	Year	VMT	Annual Percent Growth Rate
1982	1,549,466	—			
1983	1,617,340	4.4	1995	2,400,555	3.8
1984	1,678,363	3.8	1996	2,433,987	1.4
1985	1,739,350	3.6	1997	2,517,474	3.4
1986	1,800,933	3.5	1998	2,581,051	2.5
1987	1,880,862	4.4	1999	2,638,895	2.2
1988	1,966,572	4.6	2000	2,727,792	3.4
1989	2,062,893	4.9	2001	2,762,770	1.3
1990	2,130,634	3.3	2002	2,823,292	2.2
1991	2,145,074	0.7	2003	2,858,883	1.3
1992	2,204,858	2.8	2004	2,933,243	2.6
1993	2,269,835	2.9	2005	2,979,121	1.6
1994	2,313,543	1.9	2006	2,997,685	0.6

Source: FHWA, Traffic Volume Trends, May 2007

**Chart 1:  
Vehicle Miles of Travel (millions)**

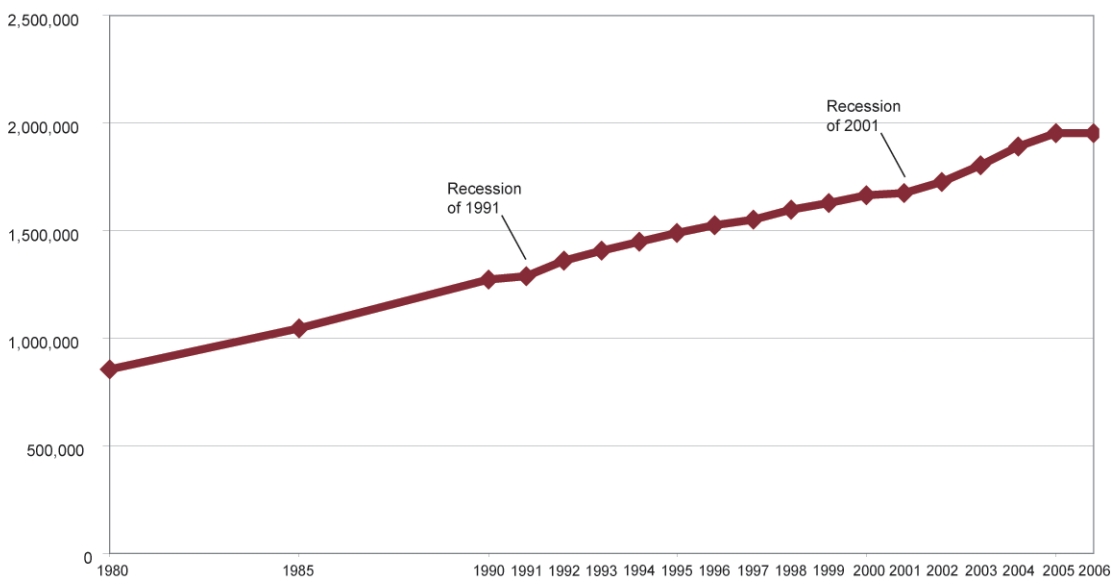


**Factors Affecting VMT Growth**

A 2006 study by Steven Polzin indicates that principal determinants of VMT include the age of the population, household composition, labor force participation and vehicle availability. The following tables and charts explain the relationship between these socio-economic variables and VMT.

**Age:** Persons between the age of 20 and 64, on average, drive more miles each year than do older or younger motorists. Table 3 shows results from the 2001 National Household Travel Survey (NHTS) conducted by the U.S. Department of Transportation.

**Chart 2:  
Urban Vehicle Miles of Travel (millions)**



Source: Bureau of Transportation Statistics, National Transportation Statistics, 2006

**Table 3:  
Annual Miles Driven  
by Age**

Age	Miles
16-19	4,486
20-29	13,078
30-39	15,285
40-49	14,727
50-59	13,300
60-64	11,254
65-69	8,715
70-79	5,566
80-99	2,761

Source: National Household Transportation Survey, 2001

Drivers under the age of 20 reported driving an average of 4,486 miles each year. Drivers between the ages of 20 and 64 drove over 11,000 miles across the board, with peak driving years between the ages of 30 and 40. Driving appears to drop off sharply after the age of 65. If the working age population declines, then a decline in the amount of driving would be expected.

**Household Type:** Table 4 shows how household composition affects VMT. Drivers in married-couple households with children drive about 23 percent more than do their childless counterparts. Drivers in two parent households drive about 40 percent more miles than drivers in single adult households.

**Table 4: Annual Miles per Driver  
by Household Type**

Number of Adults	Child Present	Miles per Driver
1	No	10,067
1	Yes	10,226
2	No	11,826
2	Yes	14,497

Source: National Household Travel Survey, 2001

**Labor Force Participation:** Persons in the labor force drive more than do persons who are not employed outside the home. In the 2001 survey, employed persons reported driving an average of 15,812 miles per year. Persons not participating in the labor force drove 8,690 miles. Workers, then, drove about 50 percent more than non-workers.

In recent decades, women have dramatically increased participation in the labor force. Table 5 shows that female labor force participation increased from about 37 percent in 1960 to about 60 percent today. It is logical to conclude that the increasing number of women in the workforce has contributed significantly to the growth in VMT in recent decades.

**Auto Ownership:** For obvious reasons, persons who do not own their own vehicles drive less than persons who own their own cars.

**What about Gas Prices?** It is logical to believe that increases in gasoline prices may lead to a reduction in driving over the long term. However, empirical studies tend to agree that travel demand is fairly inelastic with respect to price. Phil Goodwin and his associates reviewed 69 studies published since 1990. They conclude that the consensus estimate is that a 10 percent permanent increase in fuel costs will lead to a reduction in traffic volume of about 1 percent.

Chart 4 depicts monthly changes in VMT and real gasoline prices. A visual inspection of the chart shows no obvious connection between changes in gas prices and VMT. For example, falling prices during most of 1998 did not seem to stimulate additional traffic.

In real terms, gasoline prices have risen more rapidly in the last two years than in any previous period. Between February 2002 and September 2005, gasoline prices expressed in 2007 dollars rose from \$1.31 per gallon to

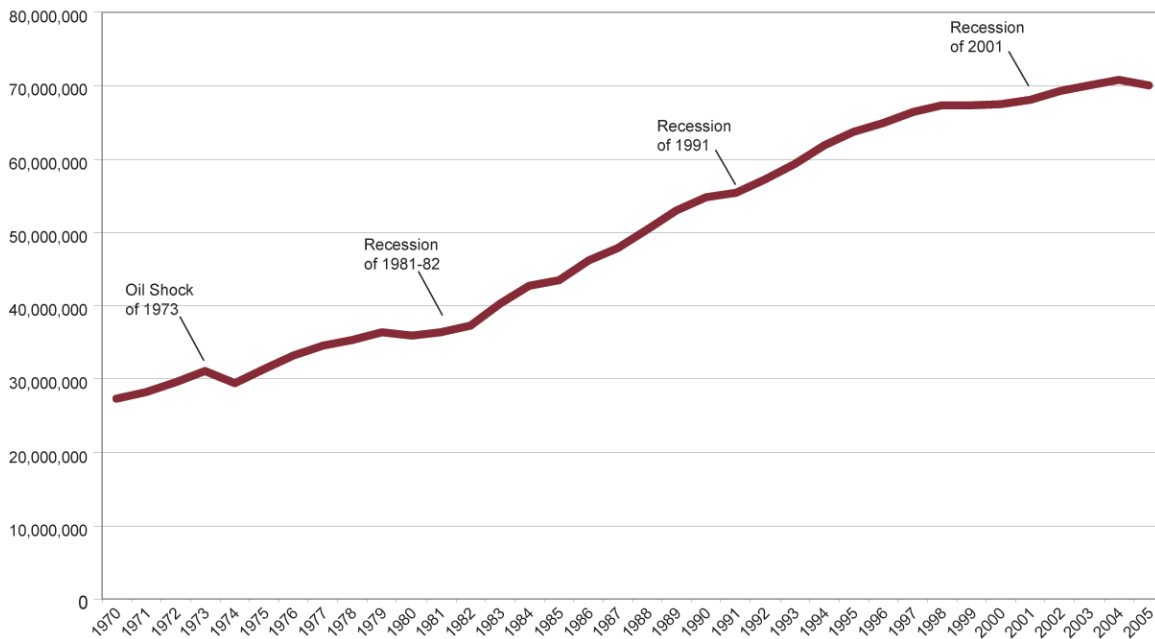
**Table 5: Female Labor Force  
Participation, US, 1960-2045**

Year	Participation Rate	Year	Participation Rate
1960	37.7	1985	54.5
1961	38.1	1986	55.3
1962	37.9	1987	56.0
1963	38.3	1988	56.6
1964	38.7	1989	57.4
1965	39.3	1990	57.5
1966	40.3	1991	57.3
1967	41.1	1992	57.8
1968	41.6	1993	57.9
1969	42.7	1994	58.8
1970	43.3	1995	58.9
1971	43.4	1996	59.3
1972	43.9	1997	59.8
1973	44.7	1998	59.8
1974	45.6	1999	60.0
1975	46.3	2000	60.2
1976	47.3	2005	60.0
1977	48.4	2010	59.2
1978	50.0	2015	57.9
1979	51.0	2020	56.3
1980	51.6	2025	54.9
1981	52.2	2030	54.0
1982	52.6	2035	53.7
1983	52.9	2040	53.7
1984	53.6	2045	53.7

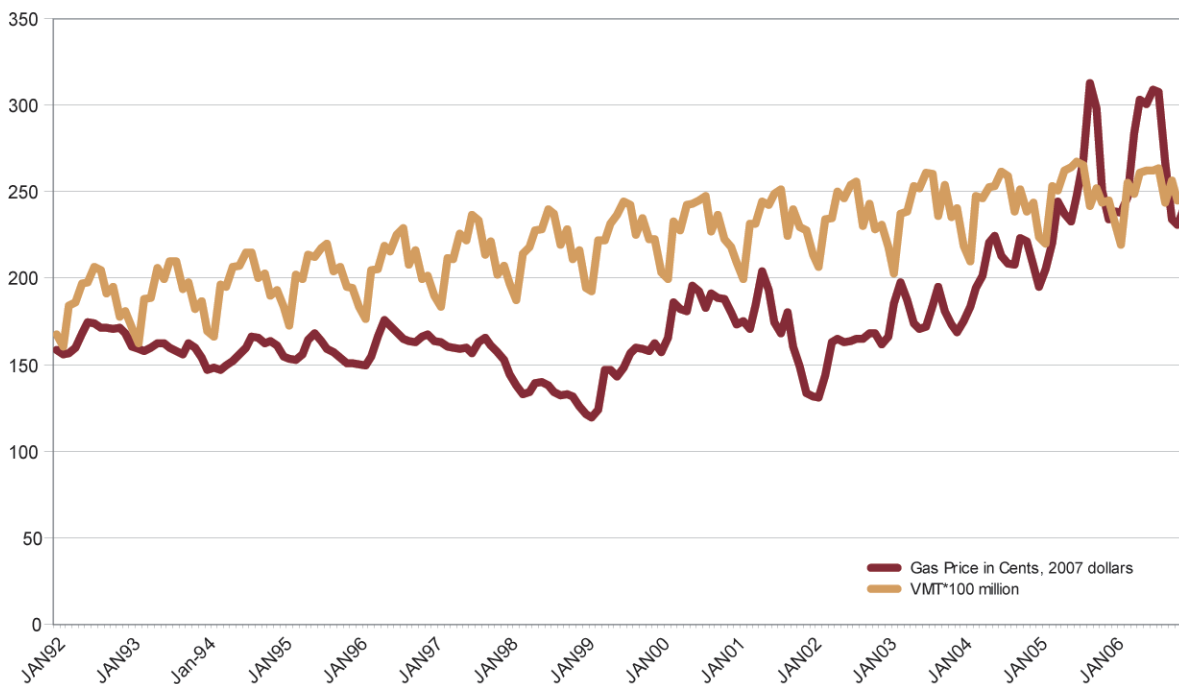
Source: BLS 2002 Age Adjusted Labor Force Participation Rates, 1960-2045

\$3.13 per gallon. Prices since then have fluctuated a great deal, but remain high. Whether real prices remain at this level remains to be seen. It is difficult to anticipate whether gas prices will contribute to reduced VMT in the future. This factor warrants close monitoring in coming months and years.

**Chart 3:**  
Average Daily Vehicle Miles of Travel, EWG Region



**Chart 4:**  
Monthly Gas Prices and VMT



## Demographic Trends

Each of the underlying factors cited above suggest that the decline in VMT growth may be a long-term trend in the St. Louis region.

**Population:** Population growth in the region has been sluggish compared to the rest of the United States, and compared to peer regions. Thus, it seems unlikely that rapid population growth will make VMT in the St. Louis region grow more rapidly than VMT in the rest of the United States.

Table 6 shows population growth rates for the eight-county East-West Gateway region from 1970 to 2000. It can be seen that for these three decades, the population growth rate in the United States was eight times greater than population growth in the region. This long-term view includes the decade of the 1970s, when the region's population actually decreased. Even in the 1990s though, population growth in the United States was four times greater than in St. Louis.

**Table 6:  
Population Growth Rates (Percent)**

Year	EWG Region	US
1970-1980	-2.5	11.4
1980-1990	2.8	9.8
1990-2000	3.9	13.2
1970-2000	4.2	38.4
Annual Percent Growth Rate, 1970-2000	0.1	0.82

Source: US Census

Total population growth can be broken down into the natural increase (births minus deaths) and net migration. A look at these two components gives little indication that population growth is likely to increase dramatically in the region in coming decades.

If the region were to attract significant numbers of new residents from outside the region, this could potentially increase the working age population, and vehicle miles traveled. However, it is unlikely that migration will significantly affect VMT.

Although it is difficult to forecast migration, past trends indicate that it is unlikely that migration will add appreciably to the working age population. Migration, in this context, refers to persons who move into the region or out of the region. Migration estimates are commonly divided into international migration and internal (or domestic) migration. Over the last ten years, the St. Louis Metropolitan Statistical Area (MSA) has had net losses in

internal migration. Between 1995 and 2000, the net internal out-migration amounted to 43,417 persons. According to Census estimates, net internal out-migration between 2000 and 2006 totaled 23,449.

During the entire decade of the 1990s, the Census Bureau estimates that the MSA gained about 25,000 persons from net international migration. This was not enough to offset population losses to the rest of the country. In this decade, Census estimates indicate that the region has gained a net of about 27,000 persons from international migration, which is slightly more than the number lost to internal migration.

If Census estimates are correct, then the region may have stopped the large net out-migration that it suffered in the late 1990s. Still, net migration added far less than 1 percent to the region's population in the period 2000-2006. An easing of national immigration restrictions or regional programs aimed at attracting more immigrants could produce an increase in migration into the region. However, migration patterns over the last ten years offer little evidence that migration will substantially alter population growth rates in the foreseeable future.

Similarly, it is unlikely that the natural increase in population will significantly affect the size of the population or VMT. The Center for Disease Control (CDC) publishes forecasts of fertility and mortality by age group for all years through the end of the 21st Century. These forecasted rates can be applied to the region using a simple technique known as cohort survival modeling. Using a cohort survival model with the assumption of no net migration yields an estimated annual growth rate of 0.46 percent for the period 2000-2035. This is roughly the same as the natural increase seen in the 1990s, and still leaves population growth in the region lagging far behind anticipated growth in the rest of the country.

In summary, foreseeable population growth trends make it unlikely that the St. Louis region will greatly outpace the rest of the nation in VMT growth over the next 10 to 20 years.

**Age:** The working age population is likely to increase somewhat over the next few years. Around the year 2015, however, the working age population is likely to decrease in size.

In the 2000 Census, the MSA had 191,711 persons between the ages of 45 and 49. These individuals will pass age 65 between the years 2015 and 2020. In 2000, the MSA had 137,307 persons under the age of four. These individuals will pass age 20 between the years 2015 and 2020.

Thus, between 2015 and 2020, more people will age out of the working age population than will enter the labor pool. (It should be noted that the 45-49 population has a higher mortality rate than the 0-4 population, making the loss in working age population even greater.) As noted above, there is no evidence to indicate that the age distribution will be significantly affected by either large-scale in-migration or through growing fertility rates.

**Household Composition:** The number of drivers in the region is not expected to increase dramatically in coming decades. However, the composition of households in which drivers live appears to be shifting in a direction that may reduce the number of miles traveled.

**Table 7:  
Household Composition,  
East-West Gateway Region**

Year	Average Household Size	Number of Married Couple Households with Children
1990	2.64	234,000
2000	2.56	226,000
2006	2.48	210,000

Source: US Census, 1990 and 2000;  
American Community Survey, 2006

Table 7 shows changes that the average household size in the East-West Gateway region is falling. Also falling is the absolute number of two-parent households. These trends can be expected to moderate VMT growth in the region.

**Labor Force Participation:** The female labor force participation rate appears to have stopped increasing, and the U.S. Bureau of Labor Statistics forecasts that female labor force participation will actually decline in coming decades. Since the explosive growth in female labor force participation has been a principal driver of VMT growth over the last 30 years, the BLS forecasts suggest that VMT may not grow as robustly in the foreseeable future.

Table 5 shows BLS forecasts for female labor force participation through the year 2045.

**Auto Ownership:** Auto ownership has become more common in recent years, even among low-income households, and the growth in auto ownership has contributed to the growth in VMT. The Center for Urban Transportation Research estimates that nationally, the percentage of households without cars dropped from over 20 percent in 1960 to about 9 percent in 2000, with almost no change between 1995 and 2000. A similar change occurred locally, with the percentage of no-vehicle households dropping from about 18 percent in 1970 to about nine percent in 2000.

In a 2007 paper, Jeffrey Memmott argues that many of the remaining zero vehicle households consist of individuals who forego auto ownership for reasons of personal choice, or because of medical issues. If this is true, then the percentage of zero vehicle households is unlikely to decrease as rapidly as it has in recent decades. Table 8 shows how the number of households without vehicles in St. Louis has fallen since 1970.

**Table 8:  
Percentage of Occupied Housing Units  
With No Available Vehicle**

County	1970	2000
Madison	12.0	7.0
Monroe	11.3	3.3
St. Clair	19.2	10.4
Franklin	12.9	5.9
Jefferson	7.2	4.3
St. Charles	6.5	3.6
St. Louis County	6.6	6.4
St. Louis City	18.1	25.2
Region	18.0	9.2

Source: US Census

## Local Hot Spots

There are some sections of roadway in the region that continue to show robust growth in VMT. The four Missouri road segments with the fastest growth, according to the Missouri Department of Transportation, are:

- I-270 between Olive and Page. Between 2000 and 2005, total volume for this section of roadway increased from about 183,000 to about 204,000, an increase of 11.3 percent. The dramatic growth was probably influenced by the recently completed construction of the Page Extension, connecting West St. Louis County to St. Charles County.
- I-70 in western St. Charles County in the vicinity of Foristell and Wentzville. A sensor located just east of US-61 showed an increase from about 59,000 to about 72,000 between 2000 and 2005, an increase of 20 percent.
- I-44, just east of I-270. A sensor located just east of Lindbergh showed an increase from 96,000 to 113,000 between 2000 and 2005, an increase of 17.5 percent.
- I-70 in eastern St. Louis County, near St. Louis city limits: Traffic volume increased from 117,000 to 131,000, or 12.2 percent. However, it is likely that construction on this segment of roadway may have affected traffic volumes during this period.

## Conclusion

Several demographic trends suggest that VMT growth is likely to remain flat:

- Female labor force participation rates have stabilized.
- The working-age population is likely to decline in absolute terms over the next decade.
- The number of two-parent households with children is declining.
- Auto ownership rates are not likely to rise dramatically in the future.
- Gasoline prices may add a further incentive to reduce driving.

Although traffic volume has stabilized, it is important to remember that there remain hotspots in the region where congestion continues to exist. However, stabilizing VMT trends suggest that it may be more effective to concentrate new construction in the vicinity of these hotspots, rather than undertaking a system-wide expansion of capacity.

Since transportation funding comes largely from a tax on gallons of gasoline, stabilizing VMT may also mean that sources of transportation funding will not grow as rapidly as they have in the past. How the region can create a stable source of funding for needed transportation improvements is an important question for planners in the region to consider.

## References

- Memmmott, Jeffrey. 2007. Trends in Personal Income and Passenger Vehicle Miles. Bureau of Transportation Statistics Special Report. October.  
[http://www.bts.gov/publications/bts\\_special\\_report/2007\\_10\\_03/html/entire.html](http://www.bts.gov/publications/bts_special_report/2007_10_03/html/entire.html)
- Missouri Department of Transportation. 2006. Average Annual Daily Vehicle Miles Traveled, 1979-2005. Data provided to East-West Gateway Council of Governments.
- Polzin, Steven E. 2006. The Case for Moderate Growth in Vehicle Miles of Travel: A Critical Juncture in U.S. Travel Behavior Trends. Center for Urban Transportation Research: Report Prepared for the U.S. Department of Transportation.  
<http://www.cutr.usf.edu/pdf/The%20Case%20for%20Moderate%20Growth%20in%20VMT-%202006%20Final.pdf>
- Goodwin, Phil, Joyce Dargay and Mark Hanly. 2004. Elasticities of Road Traffic and Fuel Consumption with Respect to Price and Income: A Review. *Transport Reviews* 24(3) pp. 275-292.
- Szafran, Robert F. 2002. Age Adjusted Labor Force Participation Rates, 1960-2045. *Monthly Labor Review* September.  
<http://www.bls.gov/opub/mlr/2002/09/art3full.pdf>
- U.S. Department of Commerce, Bureau of Census. 1970. *Census of Population and Housing*.
- U.S. Department of Commerce, Bureau of Census. 1980. *Census of Population and Housing*.
- U.S. Department of Commerce, Bureau of Census. 1990. *Census of Population and Housing*.
- U.S. Department of Commerce, Bureau of Census. 2000. *Census of Population and Housing*.
- U.S. Department of Commerce, Bureau of Census. 2006. *American Community Survey*.
- U.S. Department of Transportation, Bureau of Transportation Statistics. 2006. *National Transportation Statistics*.  
[http://www.bts.gov/publications/national\\_transportation\\_statistics/](http://www.bts.gov/publications/national_transportation_statistics/)
- U.S. Department of Transportation, Federal Highway Administration. 2001. *National Household Travel Survey*. Accessed through Oak Ridge National Laboratory, Center for Transportation Analysis.  
<http://nhts.ornl.gov/>
- U.S. Department of Transportation, Federal Highway Administration. 2007. *Traffic Volume Trends*.  
<http://www.fhwa.dot.gov/ohim/tvtw/tvtpage.htm>