



## Planners Committee

March 18, 2010

### Regional Transportation Monitoring Report

**Issue:** As part of SACOG's regional monitoring program, and in preparation for the upcoming MTP update, SACOG assembled time series data and trends for key variables related to transportation. This report has been out for review since February 17. SACOG will preview final revisions to this document.

**Recommendation:** Review the attached proposed changes, and the PDF version of the draft final report, and accept report with changes.

**Discussion:** There were a few general comments on the review draft document:

- Provide more county breakdowns of statistics—several reviewers suggested that the report would be very useful for RTPA's if more county breakdowns were provided. Due to staff time limitations, we could not provide the breakdowns in this document. We will provide at a later date an additional appendix to this report which provides county breakdowns for several of the key population, demographic and vehicle miles traveled statistics. In future updates of this report, these breakdowns will be a standard part of the report.
- There were many questions about whether SACOG intended to update this report regularly. We propose to update the report every two years, so the next update would be March 2012.

There were a couple of specific suggestions for additional statistics to include in the report:

- Auto ownership statistics from the Census and ACS.
- Split out pedestrian-involved and bike-involved collisions from total collisions.

Attached are a table and two charts proposed for addition to the report, along with accompanying text.

There were many suggested editorial changes and corrections of a minor nature—these changes will be included in the final print of the report. One change is significant enough to merit noting here:

- The significance of the apparent decline in carpooling between 2000 and 2008 was toned down in both the text and tables.

BG:gg  
Attachment

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## Added Text, Tables, and Charts

Added to the “Mode of Commute” section:

“Table 9 provides a tabulation of vehicles available per household in the SACOG region. Comparing across the 2000 Decennial Census data and the two rounds of ACS, there is an apparent trend towards more autos available. The percentage of households reporting no vehicle available declined from 7.8 percent in 2000 to about 6 percent in the more recent ACS data releases. However, FHWA staff has advised that up to one percent of the apparent difference may relate to differences in the sample and survey methodology between the 2000 Decennial Census and the ACS<sup>1</sup>. Even accounting for this methodological difference, the data indicate that the share of households with no vehicle available has declined in the region since 2000.”

**Table 9. Vehicles Available Per Household, Six-County Sacramento Region**

<b>Vehicles Available</b>	<b>2000</b>	<b>2005-2007</b>	<b>2006-2008</b>	<b>2000</b>	<b>2005-2007</b>	<b>2006-2008</b>
None	55,806	48,645	49,697	7.8%	6.0%	6.1%
One	245,302	256,220	255,840	34.4%	31.6%	31.4%
Two	281,104	321,104	325,734	39.4%	39.6%	39.9%
Three	95,395	128,072	127,970	13.4%	15.8%	15.7%
Four	25,356	40,812	40,332	3.6%	5.0%	4.9%
Five-or-more	9,903	15,541	16,493	1.4%	1.9%	2.0%
Total HH's	712,866	810,394	816,066	100.0%	100.0%	100.0%
<b>Average Auto's Per HH</b>	1.75	1.89	1.89	1.75	1.89	1.89

Source: SACOG, March 2010. Based on Year 2000 Census SF3 Tables and the 2005-2007 and 2006-2008 releases of the American Community Survey. Note on shaded cells: based on information from FHWA staff, up to 1 percent of the difference in percentage of zero-auto households may be due to difference in sample and survey methodology between the Decennial Census and ACS—i.e. the real change may be less dramatic than shown here.

Added to the “Safety” section:

“Figures 22 and 23 provide data on pedestrian-involved and bicycle-involved collisions in the six-county SACOG region. Total fatal or injury collisions were normalized to VMT (see Figure 21), because VMT is considered to be the best indicator for “exposure” to potential accidents for motor vehicle travelers. There is no such exposure data source for pedestrian- or bicycle- involved collisions. Ideally, one would want to normalize the number of collisions involving pedestrians or bicyclists with the actual number of pedestrians or bicyclists using the region’s transportation system. As mentioned above, there is not a reliable, regional data source for travel by mode, other than commute travel, which is tracked through the Census and American Community Survey. Lacking any good measure of exposure, pedestrian- and bicycle- involved collisions were normalized to population, and shown in Figures 22 and 23 as collisions-per-100,000-residents.

Figure 22 shows that both total and per-capita pedestrian-involved collisions have declined, at least

<sup>1</sup> Personal communication from Elaine Murakami, Federal Highway Administration, February 2010.

since 2004, in the six-county SACOG region. This trend could be due to many factors, including: 1) reduced numbers of pedestrians on the region’s transportation system (i.e. reduced exposure); 2) changes in driver or pedestrian behavior which have reduced collisions; or 3) improvements to the region’s pedestrian or roadway facilities which have reduced the potential for collisions between pedestrians and vehicles. Any or all of these factors could explain the trend, and with the data available in this report, there is no way to decisively explain it.

Figure 23 shows bicycle-involved collisions and collisions-per-100,000-residents, similar in format to Figure 22. Total and normalized collisions both decline from 2002 to 2005, then increase to 2008. The interpretation of the changes is subject to the same limitations and caveats as the pedestrian-involved collisions.”

**Figure 22. Pedestrian-Involved Fatal and Injury Collisions, Six-County SACOG Region, 2002 to 2008**

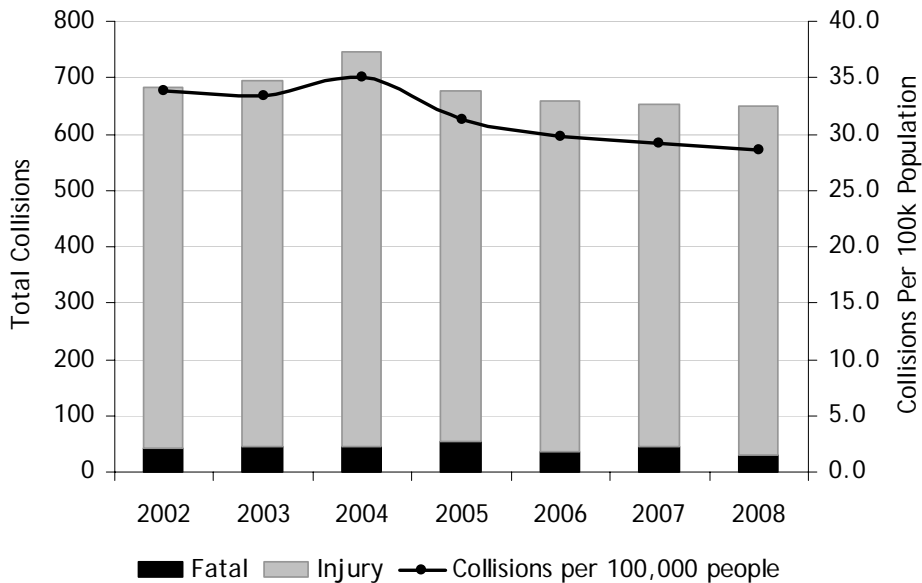
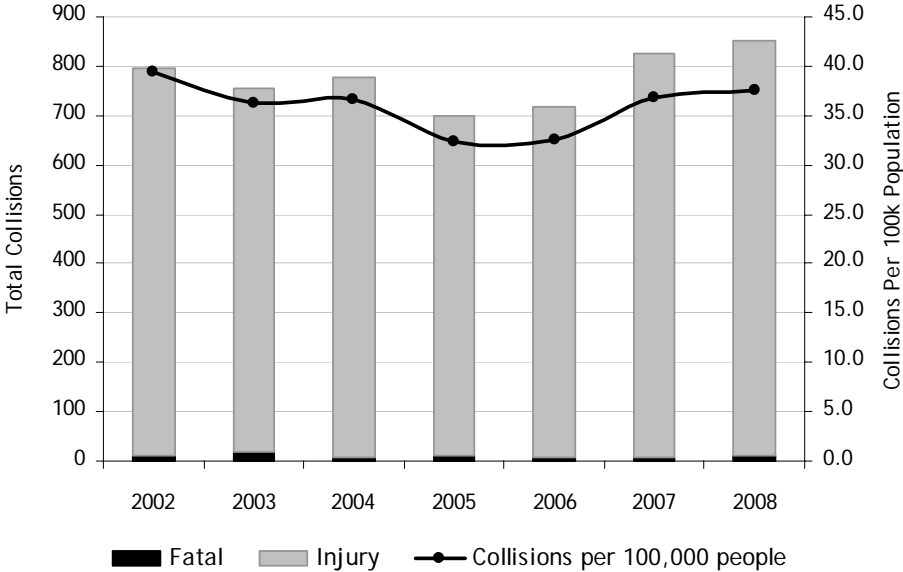


Figure 23. Bicycle-Involved Fatal and Injury Collisions, Six-County SACOG Region, 2002 to 2008



Source: SACOG, March 2010. Based on "Annual Report(s) of Fatal and Injury Motor Vehicle Traffic Collisions" by the California Highway Patrol.



*DRAFT FINAL*  
REGIONAL TRANSPORTATION MONITORING REPORT

March 18, 2010

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## Credits

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This work was done as part of Regional Transportation Monitoring Element of SACOG's Overall Work Program.

## Summary

This report provides recent trend data on several variables of great interest to transportation planning in the SACOG region. Some of the data are related to demographics and the likely transportation demand; other data are indicators of how the transportation system in the region is being used. Many of the recent changes in all indicators are related to the economic downturn and recession. The following are highlights, for which more detailed information is provided in the body of the report:

### *Population and Demographics*

- Population growth dropping off:
  - From 2002 to 2006: no year with less than +3% population growth from prior year
  - Since 2006 growth has declined to less than one percent per year.
- Evidence of the “baby boom” generation moving through the population:
  - Percentage of households headed by person aged 25-44:
    - In 2000: 41.4%
    - In 2008: 38.4%
  - Percentage of households headed by person aged 45-64:
    - In 2000: 33.6%
    - In 2008: 37.0%
- Unemployment rate skyrocketing in recent years:
  - For years up to 2007: between 5 and 6 percent;
  - In 2009: 12%.
- Percentage of new units which were multi-family or attached:
  - In year 2002: 14%
  - in year 2008: 27.6%

### *Cost of Travel*

- Gas prices increasing and volatile:
  - Hit a historic high in mid-2008 (\$4.59)
  - By the end of 2008, dropped to less than \$2.00
  - Overall change in gas prices from 2000 to 2009: +50%
- Transit fares increasing sharply:
  - Before 2007: fares stable in real terms
  - Since 2007: fares increase much higher than inflation

### *Mode of Commute*

- Carpool/vanpool mode share likely decreasing:
  - In Year 2000: 13.7%
  - In Year 2008: 12.4% to 13.4%<sup>1</sup>

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<sup>1</sup> The low number is the ACS estimate; the high number is the ACS, corrected for potential differences in the survey methods.

- Work-at-home share increasing:
  - In Year 2000: 4.0%
  - In Year 2008: 5.0%
  
- Transit, Bike and Walk increasing recently:
  - Bike and walk:
    - In year 2007: 1.3%
    - In year 2008: 1.5%
  - Transit:
    - In year 2007: 2.4%
    - In year 2008: 2.6%

### *Vehicle Miles Traveled*

- Recent declines in total VMT, due to many factors, including recession:
  - Year-over-year decreases in total VMT, 1996-2004: 1 (out of 8)
  - Year-over-year decreases in total VMT, 2004-2008: 3 (out of 4)
- Recent declines in per-capita VMT:
  - Historic high in VMT per capita: 26.2 (2003, 2004)
  - Historic low in VMT per capita: 24.5 (2008)

### *Congestion*

- Congestion growth reversing after years of sharp increases:
  - Change in vehicle hours of delay, 2000-2005: +100%
  - Change in vehicle hours of delay, 2005-2008: -47%

### *Transit Service and Ridership*

- Vehicle hours of service provided is declining in recent years:
  - Change in hours of service from 2002 to 2005: +8.8% per year
  - Change in hours of service from 2005 to 2008: -0.3% per year
- Ridership shows steady increase:
  - Change in passenger boardings from 2002 to 2005: +5.0% per year
  - Change in passenger boardings from 2005 to 2008: +2.2% per year

## Introduction

*This document is in "Draft Final" form, and is being circulated to SACOG planning partners for final review prior to wider distribution. The document includes changes to a "Review Draft" circulated in February 2010.*

The following tables and figures provide historic trend data for key variables that influence transportation (household income, age, gasoline prices, and transit service), and for key measures of transportation behavior (trips by mode, vehicle miles traveled, commute travel times and congestion levels). These data are presented for three reasons:

- 1) For general information purposes, to better understand what changes and trends are in evidence based on the most credible data sources for the region.
- 2) For developing SACOG's MTP base year datasets, which were based on Year 2005 for the last MTP and are being updated to Year 2008 for the next MTP.
- 3) For evaluating the last round of macroeconomic forecasts for the six-county Sacramento region<sup>2</sup>, which were prepared by Stephen Levy in September 2005<sup>3</sup> and included very significant projections of changes in age and income.

The data were assembled from the following sources:

- California Department of Finance for total population and dwelling unit type statistics.
- Decennial Census and the most recent 3-year releases of the American Community Survey. These U.S. Census Bureau sources were used for household income and age characteristics, plus mode of travel and commute times.
  - Year 2000 statistics came from the Decennial Census, Summary Files 1 (age, income) and Summary File 3 (mode of commute, commute travel times)
  - Two rounds of 3-year averaged survey results were used: 2005-2007 and 2006-2008. Note that the ACS three-year samples are "rolling" (i.e. they cumulate results over all three years, so the 2006-2008 data files "share" two years with the 2005-2007 files.
  - Appendix A provides more details on aggregation of Census and ACS data, and guidelines used in comparing across the datasets.
- Economic Development Department statistics are used for county level estimates of the labor force and unemployment rates.
- California Energy Commission statistics area used for gasoline prices in California.
- The "California Public Road Data" series (based in turn on the federal Highway Performance Monitoring System data) was used for lane miles and vehicle-miles-traveled statistics.

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<sup>2</sup> The "six-county Sacramento region" includes Sacramento County and the surrounding five counties: El Dorado, Placer, Sutter, Yolo and Yuba. The "SACOG region" includes all of Sacramento, Sutter, Yolo and Yuba counties, plus the portions of El Dorado and Placer counties west of the Sierra Crest.

<sup>3</sup> "Levy, Stephen, and Doche-Boulous, Viviane, "Projections of Employment, Population, Households, and Household Income in the SACOG Region for 2000-2050", Center for the Continuing Study of the California Economy, August 2005.

- For roadway congestion, two sources were used:
  - For congestion on state highways, Caltrans' District 3 annual Highway Congestion Monitoring Program reports (the so-called "HICOMP" reports); and
  - For more global congestion in the Sacramento urbanized area, the annual "Urban Mobility Reports" by the Texas Transportation Institute were used. These reports are intended to cover both arterial streets and freeways in the urbanized area.
- Traffic accident data are compiled from the Statewide Integrated Traffic Records System (SWITRS), by the California Highway Patrol. SWITRS data are based on accident reports filed by local police, sheriffs, and CHP officers in California. County-level SWITRS data were used for this report.
- Transit ridership data for operators within the SACOG region were compiled from California State Controller Reports, Triennial Performance Audits, the National Transit Database, and individual reports from specific operators.
  - Appendix B provides more detail on sources of transit service and ridership data.

Some notes on sources:

- The majority of sources reported data by county, but not consistently by geographies below county level. For nearly all tabulations and figures, six-county Sacramento region totals (i.e. the sum of the six SACOG counties in their entirety) are provided.
- As complete a time series from 2000 to 2009 are provided for every series. In most cases, the entire series of data are not available—in those cases, the available years are reported.

## Population and Housing Changes

The most basic demographic data are estimates of population and housing units. Table 1 shows a tabulation of population and housing growth for the time period from 2000 to 2009. Over the entire period, total population growth was over 385 thousand (+20.6%). However, the population growth rate in the early years was far higher than the later years (see Figure 1): year-over-year growth peaked in 2002 (+3.1%), and is lowest in 2009 (1.2%). To put this difference in perspective, population would double in 23 years at 3.1% per year; at 1.2% per year, it would take 59 years.

The mix of housing units changed during the years from 2000 to 2009. For the early years (say 2002 and before), annual percent change in single family detached dwelling units significantly outstripped population growth, and remained so until 2007. Conversely, annual percentage change in attached and multi-family dwelling units was significantly below population growth for all years up to 2004; from 2005 to 2008, the percentage change in attached and multi-family dwellings was higher than population growth. Figure 2 shows the share of annual dwelling unit growth which was attached or multi-family: for most years before 2007, the share was 15 to 20 percent; from 2007 onward, the share was over 25 percent.

Table 1. Population and Housing, 2000 to 2009, Six-County Sacramento Region (part 1 of 2)

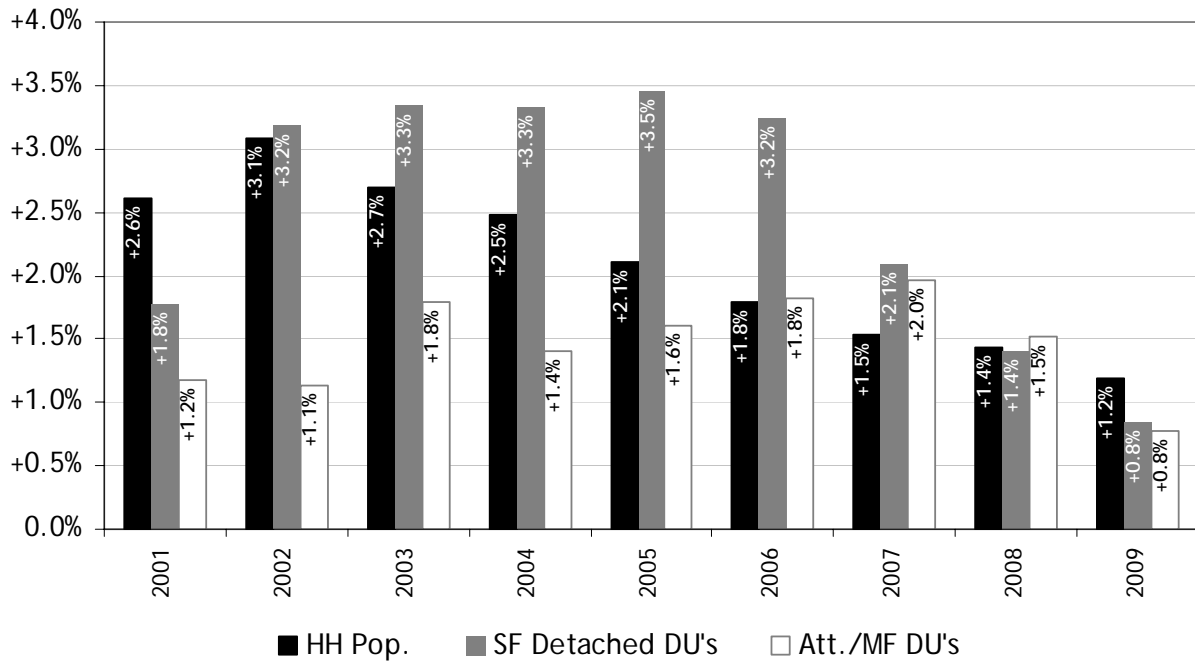
Variable		2000	2001	2002	2003	2004
Population	Household Pop.	1,872,858	1,921,780	1,980,987	2,034,300	2,084,643
	Grp.Qtrs. Pop.	39,539	40,260	39,984	40,450	40,481
	Total	1,912,397	1,962,040	2,020,971	2,074,750	2,125,124
Dwellings	Single Fam. (Det.)	494,494	503,259	519,260	536,634	554,490
	Single Fam. (Att.)	44,984	44,991	45,057	45,164	45,254
	Multi Family (2-4 Units/Struct.)	51,413	51,486	51,570	51,784	52,104
	Multi-Family (5+ Units/Struct.)	128,376	130,943	133,385	137,201	140,090
	Mob.Home/Other	32,664	32,736	32,763	32,858	32,985
	Total	751,931	763,415	782,035	803,641	824,923
Households	Total HH's	703,456	715,701	733,301	753,730	773,829
	Avg.HH Size	2.72	2.74	2.76	2.75	2.75

Table 1. Population and Housing, 2000 to 2009, Six-County Sacramento Region (part 2 of 2)

Variable		2005	2006	2007	2008	2009
Population	Household Pop.	2,128,679	2,166,774	2,200,168	2,231,740	2,258,248
	Grp.Qtrs. Pop.	40,858	40,875	41,384	41,234	40,968
	Total	2,169,537	2,207,649	2,241,552	2,272,974	2,299,216
Dwellings	Single Fam. (Det.)	573,645	592,192	604,628	613,160	618,319
	Single Fam. (Att.)	45,333	45,385	47,425	48,083	48,179
	Multi Family (2-4 Units/Struct.)	52,182	52,532	52,955	53,249	53,383
	Multi-Family (5+ Units/Struct.)	143,747	147,731	150,096	152,938	154,691
	Mob.Home/Other	33,219	33,363	33,506	33,572	33,606
	Total	848,126	871,203	888,610	901,002	908,178
Households	Total HH's	795,304	817,085	832,642	844,661	851,225
	Avg.HH Size	2.73	2.70	2.69	2.69	2.70

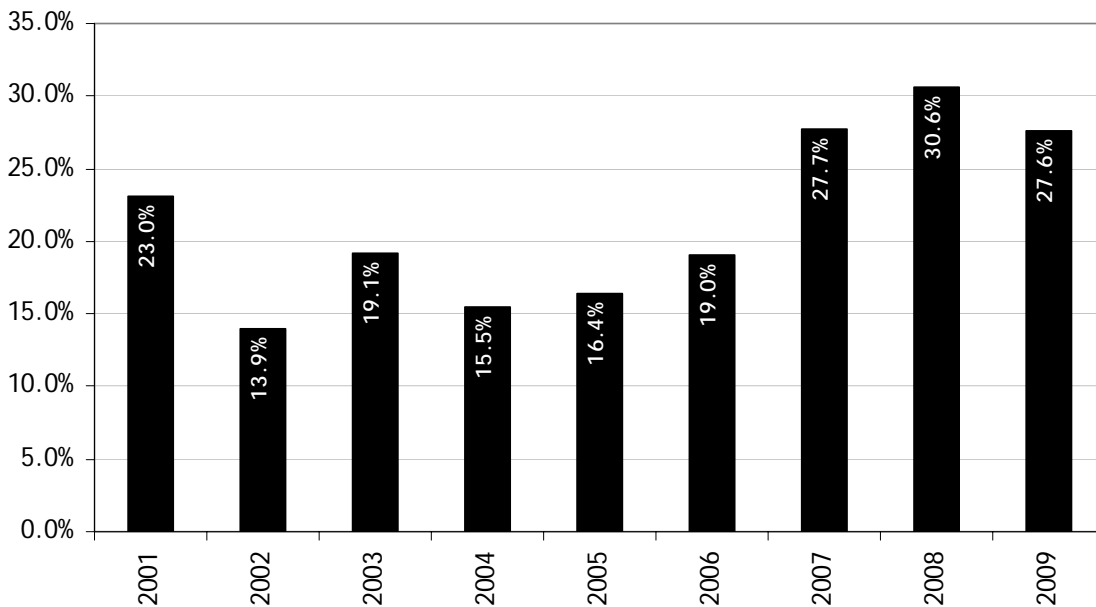
Source: SACOG, March 2010. Based on data from the California Department of Finance E-5 series. Excludes South Lake Tahoe.

**Figure 1. Population and Housing Annual Percent Change, 2000 to 2009, Six-County Sacramento Region**



Source: SACOG, March 2010. Based on data from the California Department of Finance E-5 series. Excludes South Lake Tahoe.

**Figure 2. Attached/Multi-Family Dwelling Share of Annual Growth, 2000 to 2009, Six-County Sacramento Region**



Source: SACOG, March 2010. Based on data from the California Department of Finance E-5 series. Excludes South Lake Tahoe.

## Household Income

Table 2 provides median household income tabulated from the Census and ACS<sup>4</sup>. Between 2000 and 2008, median household income in the six-county Sacramento region increased by about 3 percent in real terms. The largest percentage increases were reported in Yolo County (+11.0%) and Yuba County (+15.4%).

For the six-county area, average annual growth in income was +0.39 percent. This is significantly below average annual increase of +1.35 percent over the years 1999 to 2010 in the Levy projections. Given the high unemployment (reported below), 2009 and 2010 will at least slow income growth in the last two years of the decade, if not completely overwhelm the modest observed income increase from 1999 to 2008.

Based on the Census and ACS data, aggregated to the entire six-county area, there is no evidence of the income gap widening—increases in income were relatively evenly distributed (Figure 3).

## Age Distribution

Figure 4 shows the detailed age distribution for 2000, 2006, and 2007. Some notable changes are:

- Decreases over time in:
  - School age children (ages 5 to 17 years), 20.3 to 18.1 percent; and
  - Ages 35 to 49 years, from 23.5 to 21.3 percent.
- Increases over time in:
  - Ages 25 to 34 years, from 13.8 to 15.1 percent;
  - Ages 50 to 64 years, from 14.4 to 16.5 percent; and
  - Ages 80 or more years, from 2.9 to 3.4 percent.

Table 3 shows more aggregated age groupings, and compares the 2000 to 2007 changes to Levy projections for 2030 and 2050. The most significant change projected by Levy is a shift from the youngest age grouping (0-19 years) to the highest age grouping (80+ years). The early evidence from the Census and ACS data shows a “bulge” moving from the youngest to the middle grouping (20 to 64 years), which is consistent with the Levy projection, at least in terms of the direction of change.

Figure 5 shows age distribution by the age of the householder—this data also shows evidence of a “bulge” moving from younger householders (25-to-44-years declining from 41.4% to 38.4%) to the older householders (45-to-64-years increasing from 33.6% to 37.0%).

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<sup>4</sup> Appendix A provides details on how county-level data from the Census and ACS were aggregated to the six-county area, and how income levels were normalized to Year 2008 dollars.

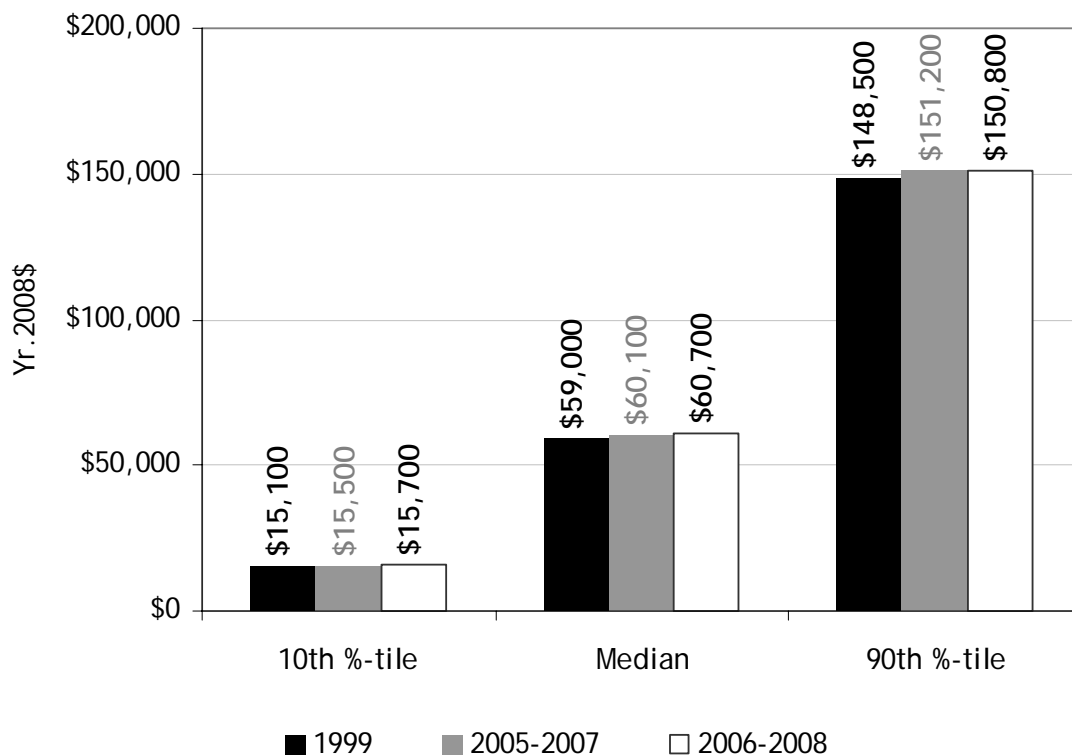
**Table 2. Median Household Income by County (Year 2008 \$)**

County	2000	2005-2007	2006-2008	'00-'06/'08 Change
El Dorado	66,952	71,039	70,022	+4.6%
Placer	74,821	70,855	73,260	-2.1%
Sacramento	56,981	57,773	57,779	+1.4%
Sutter	49,905	54,320	52,505	+5.2%
Yolo	53,018	56,205	58,851	+11.0%
<u>Yuba</u>	<u>39,612</u>	<u>43,074</u>	<u>45,727</u>	<u>+15.4%</u>
6-County	59,045	60,141	60,677	+2.8%

Source: SACOG, March 2010.

Based on Year 2000 Census SF3 Tables and the 2005-2007 and 2006-2008 releases of the American Community Survey. Income reported in the 2000 Decennial Census is Year 1999 dollars and 1999 household income; 2005-2007 ACS household income reports income in Year 2007 dollars, with years 2005 and 2006 adjusted to Year 2007 dollars; 2006-2008 ACS household income reports income in Year 2008 dollars, with years 2006 and 2007 adjusted to Year 2008 dollars. All income figures converted to Year 2008 dollars using Western States Urban CPI.

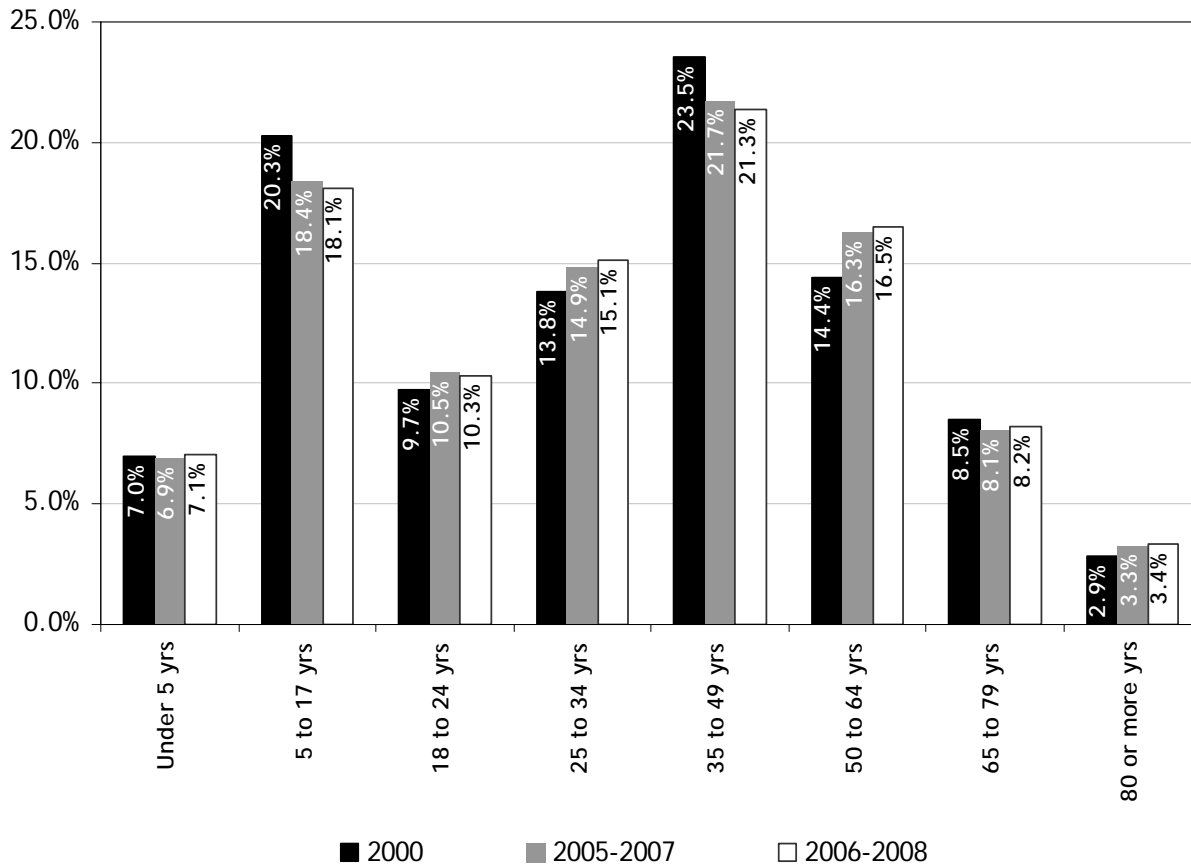
**Figure 3. Household Income Levels, Six-County Sacramento Region**



Source: SACOG, January 2010.

Based on Year 2000 Census SF3 Tables and the 2005-2007 and 2006-2008 releases of the American Community Survey. "10<sup>th</sup> percentile" means that only 10 percent of all households have income below this value; "90<sup>th</sup> percentile" means that only 10 percent have income above this value; median is the 50<sup>th</sup> percentile (equal numbers of households above and below the value). See notes to Table 2 for more details on income adjustment to Year 2008 dollars.

Figure 4. Age Distribution, Six-County Sacramento Region



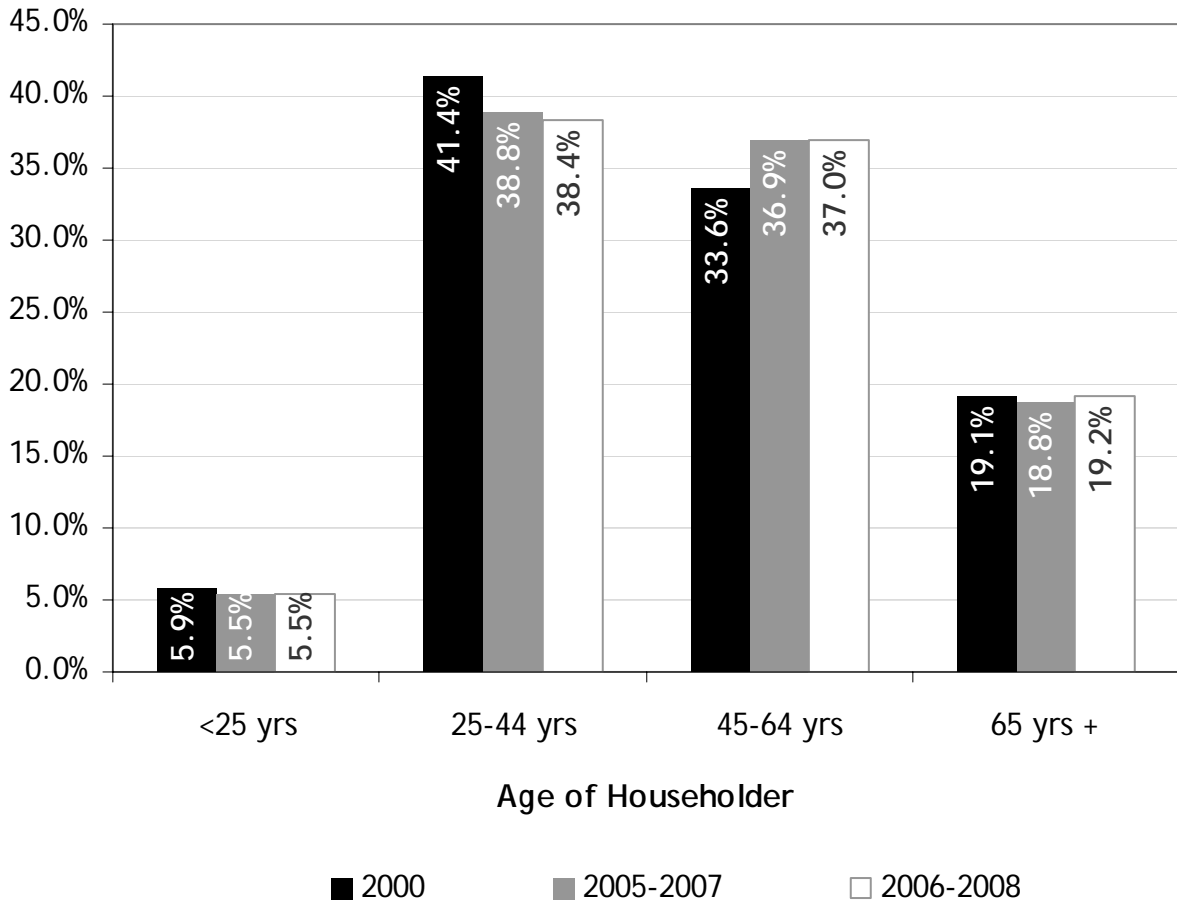
Source: SACOG, March 2010. Census/ACS from 2000 Decennial Census and the 2005-2007 and 2006-2008 ACS releases.

Table 3. Census Age Distribution Compared to Levy Projections, Six-County Sacramento Region

Age Grouping	Census/ACS			Levy Projections	
	2000	2005-2007	2006-2008	2030	2050
0 to 19 years	30.3%	28.2%	28.1%	25%	24%
20 to 64 years	58.4%	60.4%	60.4%	55%	55%
65+ years	11.3%	11.4%	11.5%	20%	21%

Source: SACOG, March 2010. Census/ACS from 2000 Decennial Census and the 2005-2007 and 2006-2008 ACS releases. Levy projections from the August 2005 CCSCE report to SACOG.

Figure 5. Percent of Households by Age of Householder, Six-County Sacramento Region



Source: SACOG, January 2010. Based on Year 2000 Census SF3 Tables and the 2005-2007 and 2006-2008 releases of the American Community Survey.

## Employment and Unemployment

With the financial crisis and economic recession, there have been significant changes in overall employment in the region in 2008 and 2009. The changes, however, do not yet show up in county-level labor force statistics (see Table 4). Through the first five months of 2009, the average labor force in each county has continued to increase steadily since 2002. Since March 2009, the labor force has started to decline, but through April, the decline has not offset increases in the earlier months of 2009.

The effects of the recession are more visible in unemployment statistics. Figure 6 illustrates monthly unemployment by county. It is clear that there are two basic patterns to unemployment in the region:

- In the four most urbanized counties (Sacramento, Placer, Yolo, and El Dorado) unemployment has consistently varied closely around 5 percent until mid-year 2007, when it started increasing steadily to over 10 percent by 2009;
- In the two most agricultural counties (Sutter and Yuba), unemployment has varied widely around an average of about 10 percent until late in 2007, when it started increasing to between 15 and 20 percent by 2009.

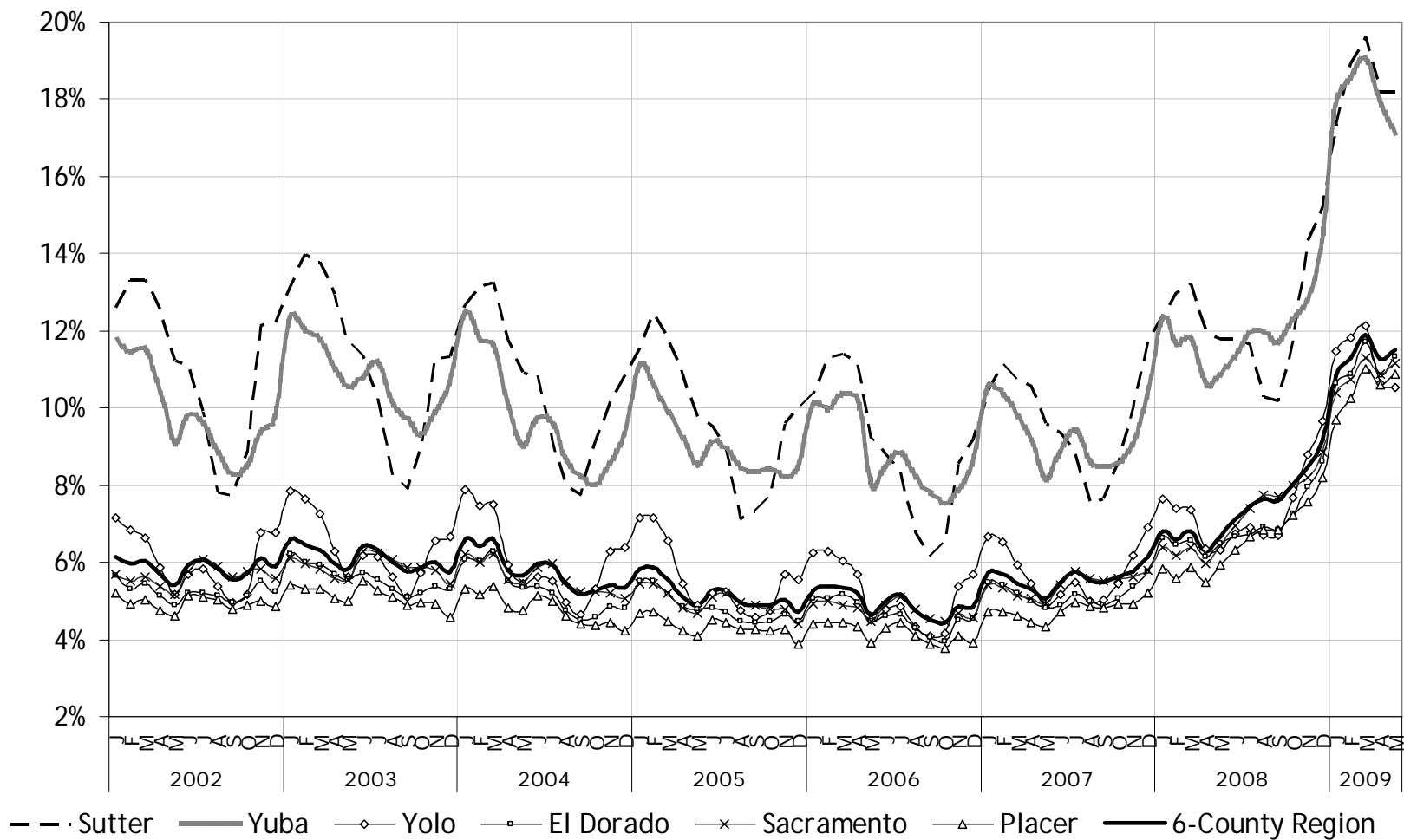
Yolo County is potentially a special case in this comparison, since it includes significant urban-oriented employment centers (Davis, Woodland, West Sacramento), as well as significant cultivated areas. For this reason, its unemployment cycle includes elements of both patterns.

Table 4. Labor Force in the Sacramento Region, 2002 to 2009

County	2002	2003	2004	2005	2006	2007	2008	2009 (part)
<i>Labor Force</i>								
El Dorado	86,621	88,110	89,183	91,551	92,480	91,329	92,352	93,229
Placer	146,984	153,855	159,135	165,147	170,556	174,285	176,215	177,482
Sacramento	645,543	656,974	661,641	667,992	675,556	682,881	690,433	693,686
Sutter	39,261	39,712	40,217	40,233	40,774	41,414	42,036	43,389
Yolo	90,942	91,964	92,269	92,868	94,550	98,537	99,503	100,263
Yuba	<u>25,130</u>	<u>25,380</u>	<u>25,339</u>	<u>25,834</u>	<u>26,820</u>	<u>27,630</u>	<u>28,063</u>	<u>28,943</u>
Total	1,034,481	1,055,995	1,067,784	1,083,624	1,100,735	1,116,076	1,128,602	1,136,991
<i>Year-to-Year Changes</i>								
El Dorado	n/a	+1.7%	+1.2%	+2.7%	+1.0%	-1.2%	+1.1%	+1.0%
Placer	n/a	+4.7%	+3.4%	+3.8%	+3.3%	+2.2%	+1.1%	+0.7%
Sacramento	n/a	+1.8%	+0.7%	+1.0%	+1.1%	+1.1%	+1.1%	+0.5%
Sutter	n/a	+1.1%	+1.3%	+0.0%	+1.3%	+1.6%	+1.5%	+3.2%
Yolo	n/a	+1.1%	+0.3%	+0.6%	+1.8%	+4.2%	+1.0%	+0.8%
Yuba	n/a	<u>+1.0%</u>	<u>-0.2%</u>	<u>+2.0%</u>	<u>+3.8%</u>	<u>+3.0%</u>	<u>+1.6%</u>	<u>+3.1%</u>
Total	n/a	+2.1%	+1.1%	+1.5%	+1.6%	+1.4%	+1.1%	+0.7%
Pop. Changes	n/a	+2.7%	+2.5%	+2.1%	+1.8%	+1.5%	+1.4%	+1.2%

Source: SACOG, March 2010. Based on statistics from the California Employment Development Department.

Figure 6. Monthly Unemployment Rate by County in Sacramento Region, 2002-2009



Source: SACOG, March 2010. Based on California Employment Development Department data.

## Gasoline Prices

From 1990 to about 2002, gasoline prices varied, but in general, varied closely around a relatively stable average. Additionally, during that time period, variations in price tended to be predictable, seasonal variations (e.g. prices running up and peaking in the summer months, and dropping during fall/winter months). From 2002 onward, gasoline price variations became both more volatile and less predictable.

Figure 7 illustrates nominal and real changes in gasoline prices in California from 1998 through 2009. Two changes are notable:

- 1) a steady increase in gasoline prices from 2003 through most of 2008 (albeit with many peaks and troughs throughout this period); and
- 2) a precipitous drop in prices at the end of 2008, when worldwide demand for petroleum dropped due to the economic recession.

Table 5 provides annual average fuel prices, along with highs and lows for 2002 to 2009. The right-most column reports inflation adjusted annual average prices. The annual averages buffer most of the price volatility, and highlight the general trends in prices:

- 1) For most years in the series, year-over-year changes are double-digit percentages;
- 2) Between 2008 and 2009, average inflation-adjusted price dropped by 23.8%; and
- 3) Over the entire time period (2002 to 2009) inflation-adjusted price increased by 50%.

## Transit Fares

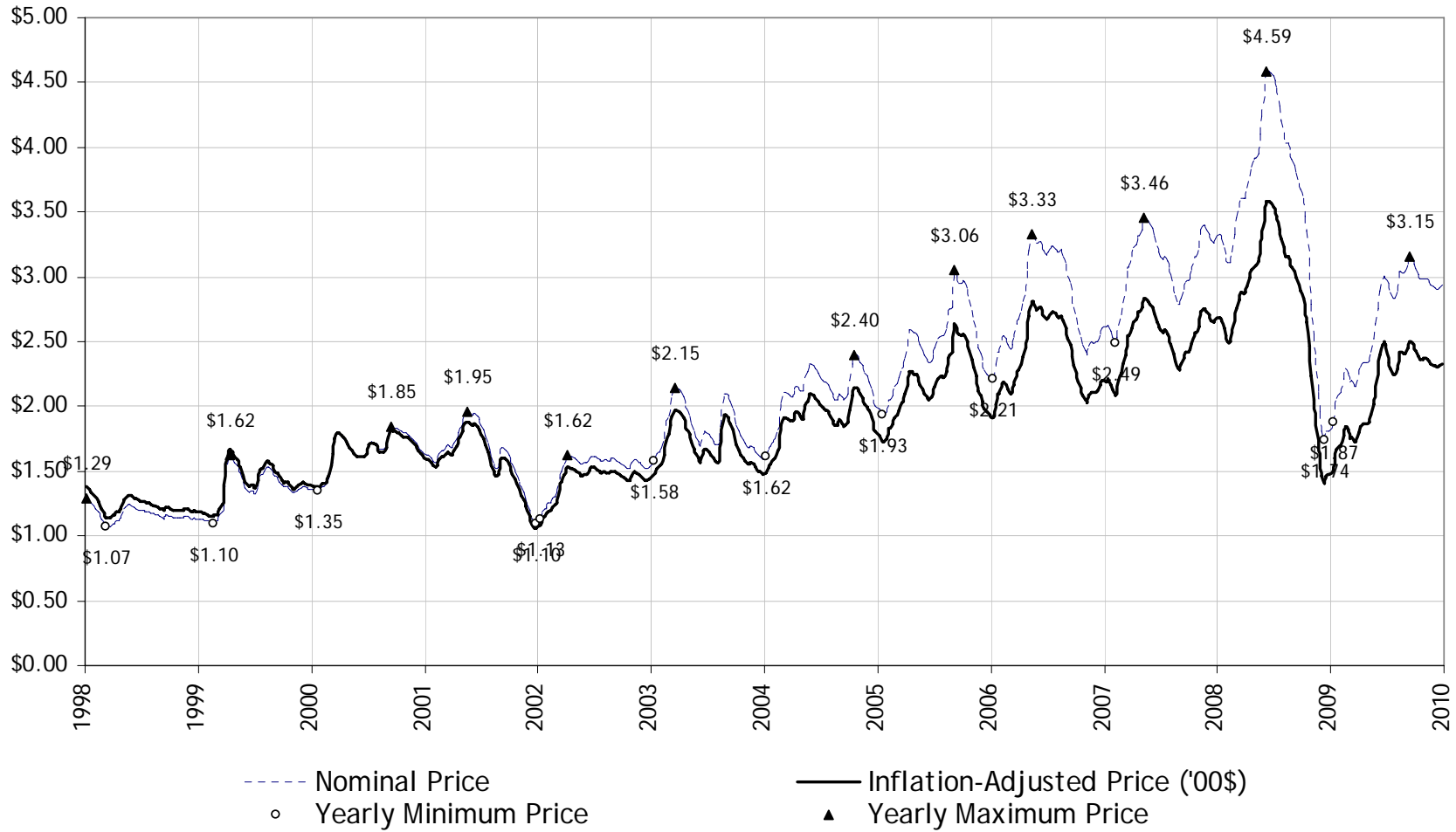
Published, "walk-up" basic fares are illustrated in Figures 8 through 10 for Sacramento Regional Transit and for YoloBus Local and Express services. For both operators, fare increases prior to about 2006 kept basic fares tracking to inflation. With these increases, basic fares tracked in a step-wise fashion around relatively stable real (i.e. inflation-adjusted) fares. More recent fare increases in 2009 and 2010 are real increases, which go well beyond recent inflation.

Table 5. Annual California Gasoline Price, 2002 to 2009

Year	Nominal Gas Price (\$ per Gallon, Reg. grade)			Inflation-Adjusted Gas Price ('00 \$ per Gallon, Reg. grade)		
	High	Low	Avg	High	Low	Avg
<i>Annual Price</i>						
2002	\$1.61	\$1.19	\$1.51	\$1.52	\$1.13	\$1.42
2003	\$2.10	\$1.61	\$1.83	\$1.94	\$1.51	\$1.69
2004	\$2.33	\$1.68	\$2.11	\$2.08	\$1.54	\$1.91
2005	\$2.99	\$1.97	\$2.47	\$2.58	\$1.76	\$2.16
2006	\$3.28	\$2.38	\$2.80	\$2.76	\$2.06	\$2.37
2007	\$3.44	\$2.57	\$3.08	\$2.81	\$2.16	\$2.53
2008	\$4.48	\$1.82	\$3.52	\$3.50	\$1.48	\$2.79
2009	\$3.12	\$2.01	\$2.67	\$2.47	\$1.62	\$2.13
<i>Year-to-Year % Change</i>						
'02 to '03	+ 30.6%	+ 36.1%	+ 21.1%	+ 27.7%	+ 33.0%	+ 18.7%
'03 to '04	+ 10.8%	+ 3.8%	+ 15.8%	+ 7.6%	+ 2.3%	+ 13.1%
'04 to '05	+ 28.3%	+ 17.5%	+ 16.8%	+ 24.1%	+ 14.4%	+ 13.3%
'05 to '06	+ 9.6%	+ 20.9%	+ 13.5%	+ 6.8%	+ 16.6%	+ 9.8%
'06 to '07	+ 4.9%	+ 8.1%	+ 9.7%	+ 1.9%	+ 4.9%	+ 6.3%
'07 to '08	+ 30.4%	- 29.1%	+ 14.3%	+ 24.6%	- 31.4%	+ 10.3%
'08 to '09	- 30.4%	+ 10.0%	- 24.1%	- 29.5%	+ 9.4%	- 23.4%
<i>'02 to '09</i>	<i>+ 93.9%</i>	<i>+ 69.2%</i>	<i>+ 77.1%</i>	<i>+ 62.9%</i>	<i>+ 42.9%</i>	<i>+ 50.0%</i>

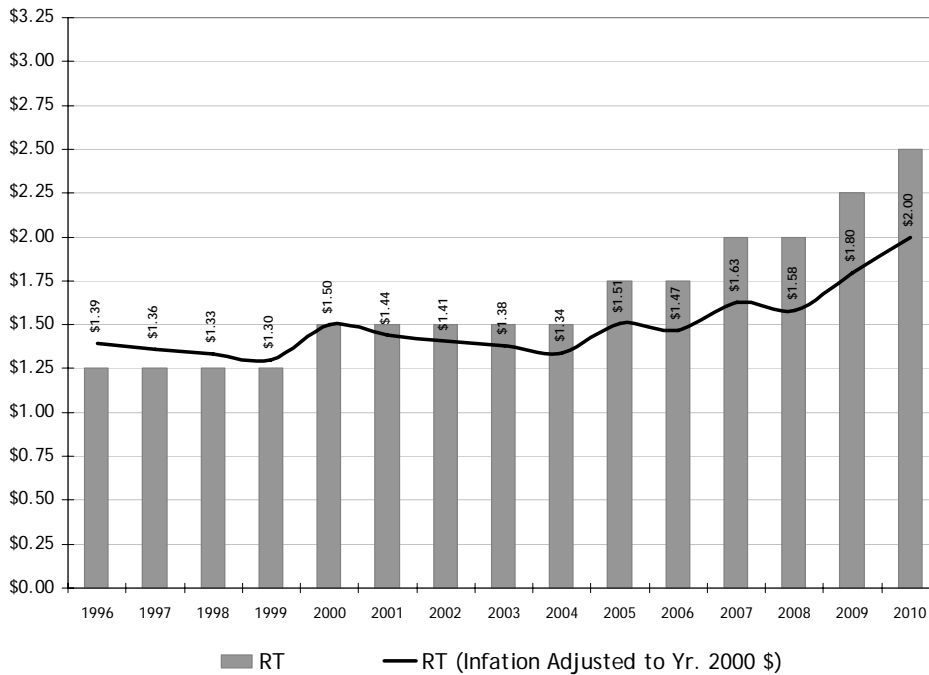
Source: SACOG, March 2010. Based on weekly price data from the California Energy Commission, rolled up to monthly averages. E.g. the "high" price shown is the highest average monthly price during the year cited. Annual average prices computed as simple averages of monthly prices for each year. Converted to Year 2000 dollars using the Western States Urban Consumer Price Index.

Figure 7. Weekly California Gasoline Price, 1998 to 2009



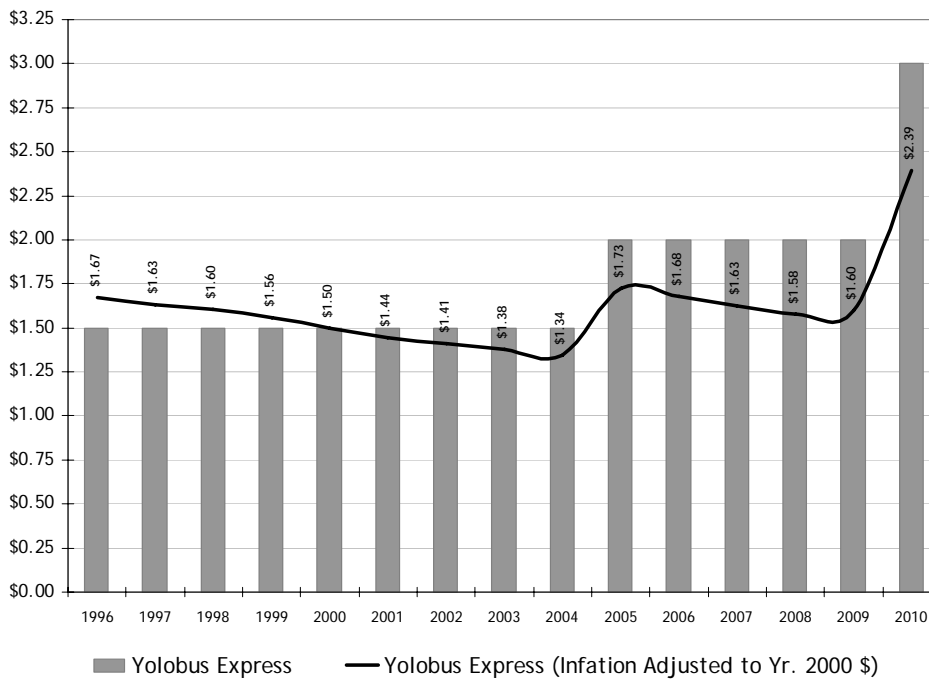
Source: SACOG, March 2010. Based on weekly price data from the California Energy Commission. Prices are for "Regular" grade gasoline. Inflation adjustment based on Western States Urban CPI.

Figure 8. Basic One-Way Fare: Sacramento Regional Transit, 1996 to 2010



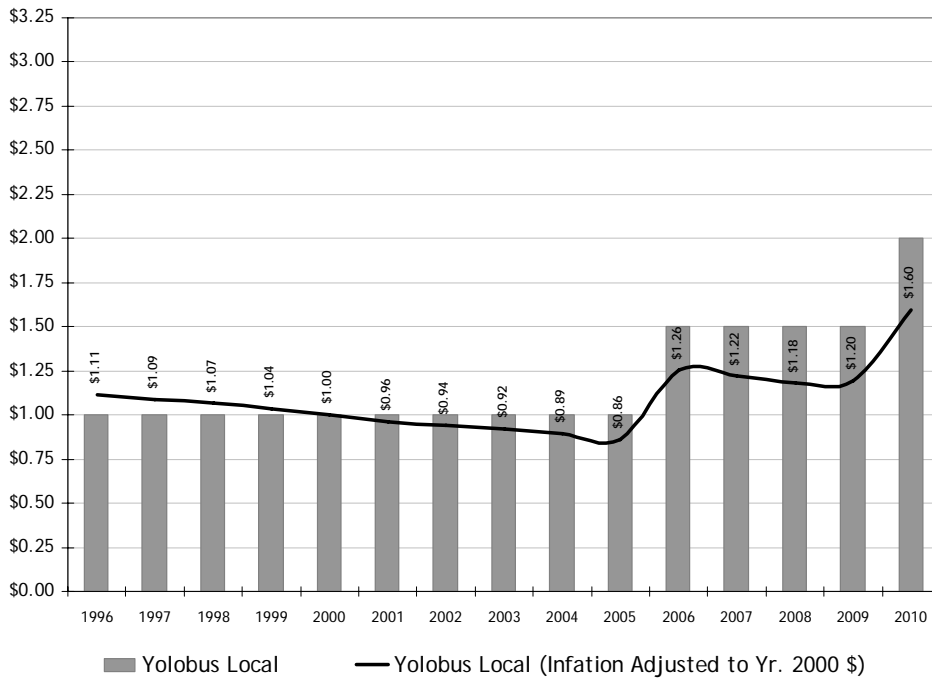
Source: SACOG, March 2010. Based on historic data and published fares.

Figure 9. Basic One-Way Fare: YoloBus Express Service, 1996 to 2010



Source: SACOG, March 2010. Based on historic data and published fares.

Figure 10. Basic One-Way Fare: Yolobus Local Service, 1996 to 2010



Source: SACOG, March 2010. Based on historic data and published fares.

## Commute Mode

The Decennial Census and the American Community Survey both question workers over 16 years of age regarding their mode of travel to work and their travel time. The Census and ACS do not survey for mode of travel, times, or any other information regarding non-commute travel—for non-commute travel, SACOG relies on periodic household travel surveys, the most recent of which was completed in 2000. Commute trips in the SACOG region account for about 25 percent of all person trips and nearly one-half of all household-generated vehicle miles traveled.

Two notable trends in commute mode are apparent in the Census and ACS data (see Table 6):

- 1) Carpool/vanpool commuters as a share of all modes is declining, from about 13.7 percent in 2000 to about 12.4 percent in the latest ACS survey (Figure 11);
- 2) Work-at-home as a share of all workers increased from 4 to 5 percent between 2000 and the latest ACS survey (Figure 12).

Note that differences in the sample and survey method between the 2000 Decennial Census and ACS may account for part of the difference between 2000 and the 2005-2007 ACS estimate of carpool share. Nationally, the long-term decline in carpool commute mode share has been widely observed and reported<sup>5</sup>. Within the SACOG region, there was little change in carpool percentage between the 1990 and 2000 Decennial Census. The combination of the decrease implied in the data between 2000 and the 2005-2007 ACS, and the decline shown between the 2005-2007 and 2006-2008 ACS data, suggests that the general trend observed nationally is also in evidence in the SACOG region.

Also, national data from the 2000 Decennial Census and the 2000 ACS one-year data indicate that due to the survey method, ACS carpool share estimates may be as much as one percent lower than the estimate of carpool share in the 2000 Census. Accounting for that potential bias, the 2005-2007 ACS carpool share may be 13.9 percent (a slight *increase* from Year 2000) and 13.4 percent in the 2006-2008 ACS (a slight decline from Year 2000). This mode share should be closely observed and tracked through future releases of ACS data.

Besides the likely decline in carpooling, two significant changes occurred between the 2005-2007 and 2006-2008 ACS three-year averaged surveys, which were not statistically significant between 2000 and the 2005-2007 ACS survey<sup>6</sup>:

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<sup>5</sup> See especially Pisarski, Alan, "Commuting in America III", published by the Transportation Research Board, 2006.

<sup>6</sup> The statistical tests of estimates of commuters by mode, and estimates of commute mode shares, for ACS surveys were performed as if the samples of the 3-year rolling averages were independent samples—they are not, though. Since the rolling sample for each year includes 2 years of data from the prior 3-year rolling average (e.g. 2006 and 2007 samples are included in

- 1) Public transit commuters as a share of all modes increased from 2.4 to 2.6 percent.
- 2) Bike commuters as a share of all modes increased from 1.3 to 1.5 percent.

## Commute Travel Time

Table 7 and Figure 13 provide the distribution of commuters by reported travel time to work<sup>7</sup> from the 2000 Decennial Census and the ACS three-year averaged data, for the six-county Sacramento region as a whole. Both the table and figure present a general “lengthening” shift, with higher shares of commuters reporting longer travel times in the later surveys. The most striking shifts of this sort are:

- 1) The increase in the percentage of workers reporting commuting 45-minutes-or-more from 13.7 percent in 2000 to 15.4 percent in the 2006-2008 ACS survey).
- 2) The decrease in the percentage of workers reporting commuting from 10 to 20 minutes from 30.7 to 29.9 percent.

Table 8 and Figure 14 provide average reported commute times by county for the six-county Sacramento region. Regionally, average commute time increased modestly (2.7 percent from 2000 to 2005-2007 ACS survey, and 0.3 percent from the 2005-2007 to 2006-2008 ACS survey); however, differences in average commute time by county showed much higher geographic variation in the changes:

- 1) Average commute times reported by workers in Yuba and Sutter counties increased by far more than the regional average.
  - a. In Sutter County, times increased by 8 percent between the 2000 and 2005-2007 surveys, and another 4.7 percent between the 2005-2007 and 2006-2008 surveys.
  - b. In Yuba County, the same changes were 10.3 and 2.1 percent.
  - c. In both counties, the number of workers increased by over 20 percent—the most likely reason for the increase in commute times is that many of the new resident workers through the three

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both the 2005-2007 and 2006-2008 ACS samples). Because of this, differences of estimates are likely to be muted.

<sup>7</sup> There are consistent biases in the reported commute times: commuters tend to remember longer times; times by many respondents get “rounded up” to 5-minute intervals rather than exact times; and commuters are likely not consistent regarding the beginning and end of their trip (e.g. Is the start time when they walk out their front door, or when they pull out of the driveway? Is the end time when they arrive at their workplace, or when they get to their parking place?). It is assumed that these biases are consistent across samples and survey years, so differences from one survey year to the next are meaningful; however, the times are not assumed to be accurate to “real” travel times.

surveys commute longer distances to jobs in Sacramento and Placer counties<sup>8</sup>.

- 2) Reported commute times declined slightly for El Dorado County workers, by 2.2 percent and one percent between the three surveys, respectively. A number of explanations could account for these changes: the HOV lanes on US-50 between El Dorado Hills Boulevard and Sunrise Boulevard were opened in 2003 and did result in significant reduction in travel times for commuters from El Dorado County to Sacramento. Additionally, significant employment growth has occurred in El Dorado County during these years, and some commuters may have relocated workplaces to within the county<sup>9</sup>.

Table 9 provides a tabulation of vehicles available per household in the SACOG region. Comparing across the 2000 Decennial Census data and the two rounds of ACS, there is an apparent trend towards more autos available. The percentage of households reporting no vehicle available declined from 7.8 percent in 2000 to about 6 percent in the more recent ACS data releases. However, FHWA staff have advised that up to one percent of the apparent difference may relate to differences in the sample and survey methodology between the 2000 Decennial Census and the ACS<sup>10</sup>. Even accounting for this methodological differences, the data indicate that the share of households with no vehicle available has declined in the region since 2000.

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<sup>8</sup> ACS datasets do not currently report location of workplace—these data should be available in future releases of ACS data.

<sup>9</sup> Ibid.

<sup>10</sup> Personal communication from Elaine Murakami, Federal Highway Administration, February 2010.

Table 6. Mode of Commute, Six-County Sacramento Region

Mode of Commute (Detailed)	2000		2005-2007			2006-2008		
	Workers	%	Workers	MOE	Mode Share	Workers	MOE	Mode Share
Drove alone	642,403	75.4%	754,530	6,929	75.3%	767,175	6,502	75.2%
In 2-person carpool			101,033	3,726	10.1%	100,319	3,792	9.8%
In 3-person carpool			17,241	1,699	1.7%	16,276	1,560	1.6%
In 4-or-more-person carpool			<u>10,945</u>	<u>1,545</u>	<u>1.1%</u>	<u>10,122</u>	<u>1,181</u>	<u>1.0%</u>
Carpooled	116,672	13.7%	129,219	4,398	<b>12.9%</b>	126,717	4,203	<b>12.4%</b>
Bus or trolley bus			18,450	1,522	1.8%	20,049	1,610	2.0%
Streetcar or trolley car			1,855	471	0.2%	2,262	607	0.2%
Subway or elevated			1,285	408	0.1%	1,390	421	0.1%
Railroad			2,191	510	0.2%	2,315	475	0.2%
Ferryboat			<u>157</u>	<u>406</u>	<u>0.0%</u>	<u>88</u>	<u>391</u>	<u>0.0%</u>
Public Transit Total	21,672	2.5%	23,938	1,657	2.4%	26,104	1,743	<b>2.6%</b>
Bicycle	11,107	1.3%	12,938	1,295	1.3%	14,932	1,358	<b>1.5%</b>
Walked	18,432	2.2%	21,373	1,760	2.1%	21,617	1,623	2.1%
Taxicab, motorcycle, other	7,993	0.9%	11,738	1,192	<b>1.2%</b>	12,956	1,170	1.3%
Worked at home	34,083	4.0%	47,874	2,307	<b>4.8%</b>	50,963	2,229	5.0%
Total	852,362	100.0%	1,001,610	5,759	100.0%	1,020,464	6,667	100.0%

Source: SACOG, January 2009. Based on Year 2000 Census SF3 Tables and the 2005-2007 and 2006-2008 releases of the American Community Survey. No margin of error (MOE) was reported for the Year 2000 Decennial Census; ACS reports 90% confidence level MOE. Mode shares shown in *bold italic* are statistically different from the prior series mode share at 90% confidence level. **Bold shaded** cells show estimates in the ACS 2005-2007 data which are significantly different from the 2000 Decennial Census, but where differences in the survey method and sample may account for part of the difference. Some research suggests that the difference in ACS estimates of carpool share may be as much as one percent lower than the Decennial Census share for Year 2000.

Figure 11. Percent of Workers Driving to Work, Six-County Sacramento Region

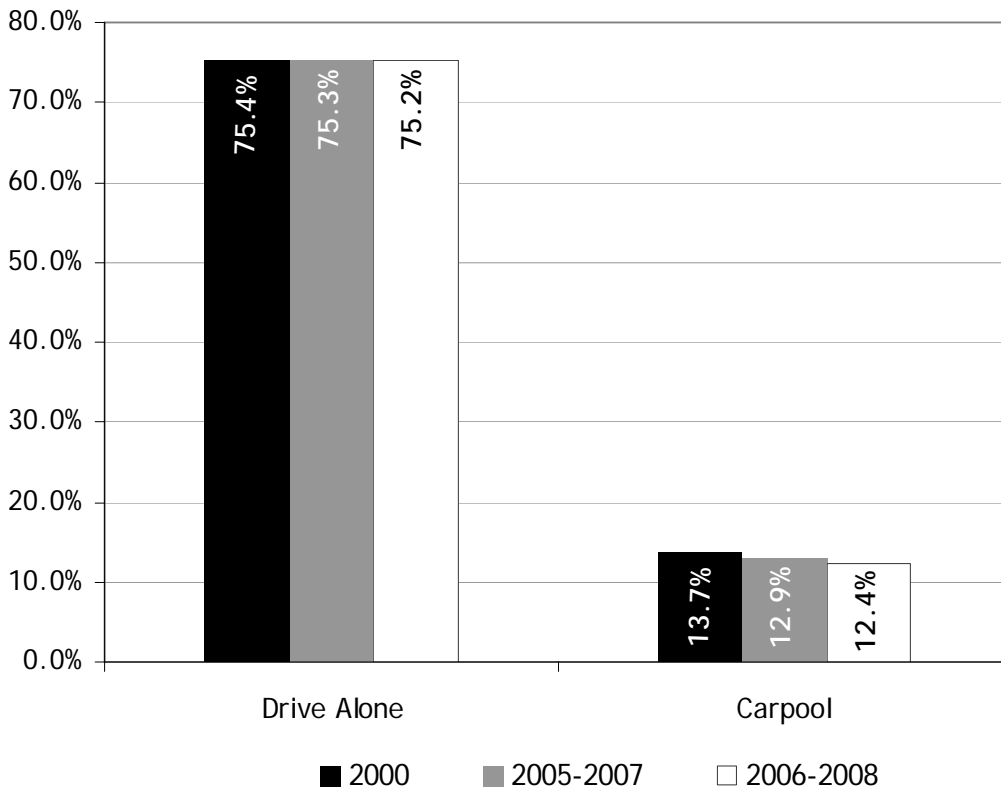
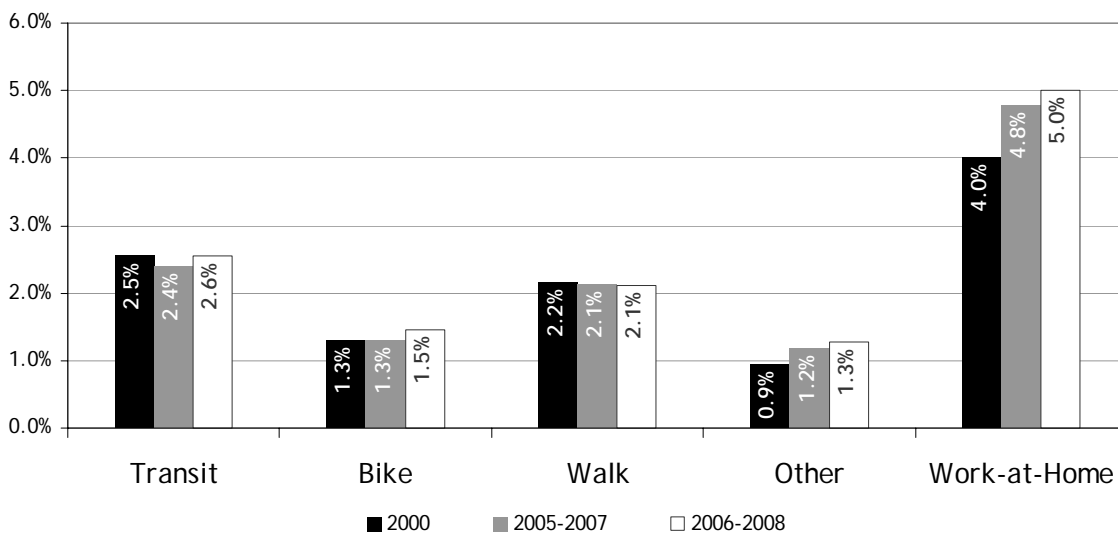


Figure 12. Percent of Workers Using Non-Auto Modes of Commute, Six-County Sacramento Region



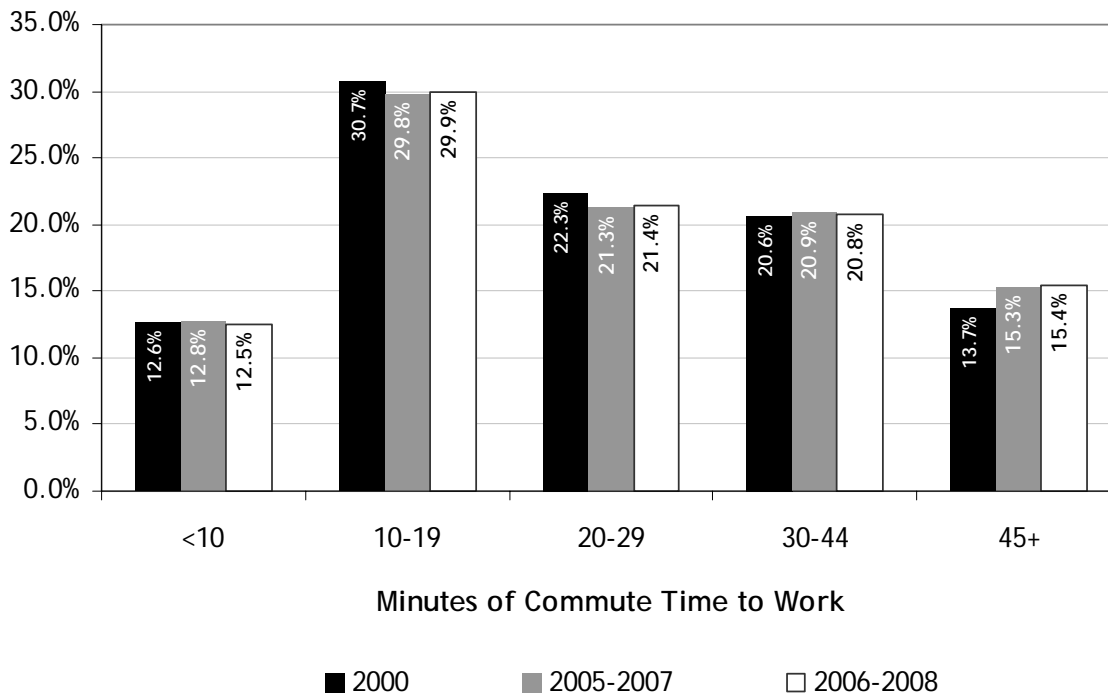
Source for both figures: SACOG, January 2009. Based on Year 2000 Census SF3 Tables and the 2005-2007 and 2006-2008 releases of the American Community Survey. For ACS years, midpoint mode share is graphed—see Appendix A for information on margin-of-error for ACS estimates. See text, notes to Table 6, and Appendix A for comparability of ACS and Decennial Census estimates.

**Table 7. Reported Commute Travel Times, All Workers Not Working at Home, Six-County Sacramento Region**

Travel Time	2000		2005-2007			2006-2008		
	Workers	%	Workers	MOE	%	Workers	MOE	%
Less than 5 minutes	21,214	2.6%	26,798	1,829	2.8%	27,713	1,861	2.9%
5 to 9 minutes	82,272	10.1%	95,000	3,355	10.0%	93,368	3,234	9.6%
10 to 14 minutes	121,234	14.8%	137,519	4,026	14.4%	138,236	3,938	14.3%
15 to 19 minutes	130,321	15.9%	146,381	3,729	15.3%	151,931	3,946	15.7%
20 to 24 minutes	128,693	15.7%	143,493	4,043	15.0%	147,251	3,634	15.2%
25 to 29 minutes	53,843	6.6%	59,709	2,485	6.3%	59,920	2,552	6.2%
30 to 34 minutes	118,845	14.5%	134,257	3,481	14.1%	138,790	3,880	14.3%
35 to 39 minutes	22,869	2.8%	28,901	1,729	3.0%	27,829	1,723	2.9%
40 to 44 minutes	27,149	3.3%	36,198	1,885	3.8%	35,232	1,861	3.6%
45 to 59 minutes	55,683	6.8%	72,238	2,709	7.6%	74,167	2,702	7.7%
60 to 89 minutes	32,562	4.0%	45,772	2,356	4.8%	46,254	2,312	4.8%
90 or more minutes	<u>23,594</u>	<u>2.9%</u>	<u>27,470</u>	<u>1,777</u>	<u>2.9%</u>	<u>28,810</u>	<u>1,757</u>	<u>3.0%</u>
Total	818,279	100.0%	953,736	5,716	100.0%	969,501	6,753	100.0%

Source: SACOG, January 2009. Based on Year 2000 Census SF3 Tables and the 2005-2007 and 2006-2008 releases of the American Community Survey. "MOE" = Margin-of-error, computed at 90% confidence interval.

**Figure 13. Percent of Workers by Commute Travel Time, Six-County Sacramento Region**



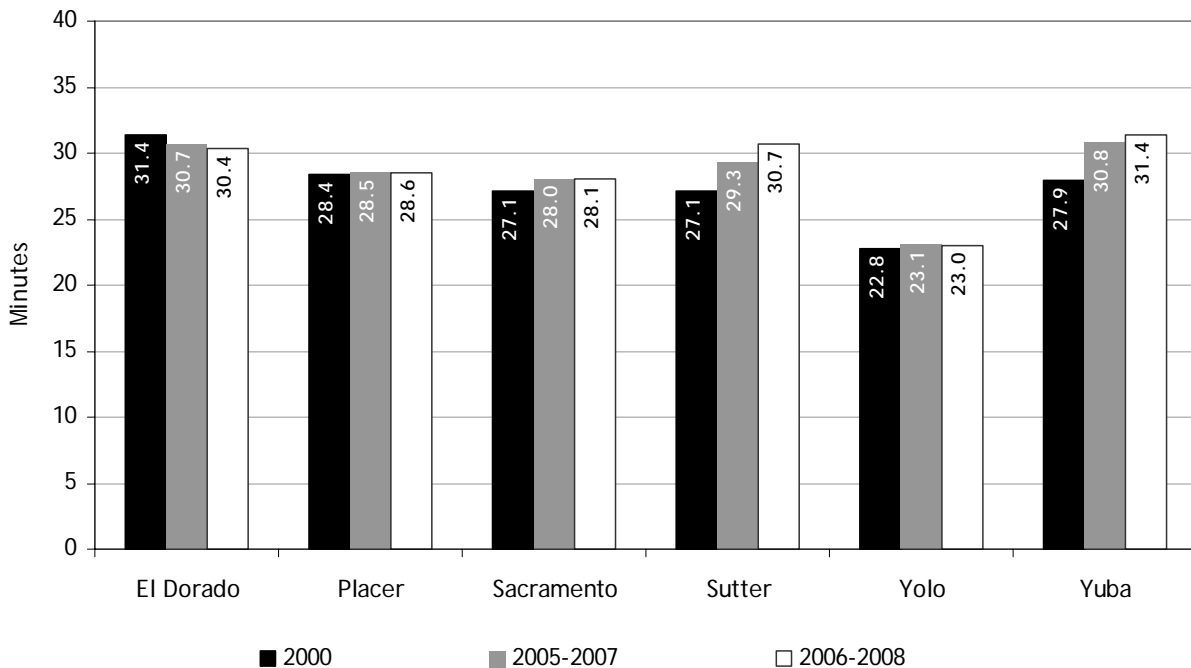
Source: SACOG, January 2009. Based on Year 2000 Census SF3 Tables and the 2005-2007 and 2006-2008 releases of the American Community Survey.

**Table 8. Reported Commute Time by County, Six-County Sacramento Region**

Time Period	El Dorado	Placer	Sacramento	Sutter	Yolo	Yuba	6-County
<i>Average Travel Time (Minutes)</i>							
2000	31.4	28.4	27.1	27.1	22.8	27.9	27.3
2005-2007	30.7	28.5	28.0	29.3	23.1	30.8	28.0
2006-2008	30.4	28.6	28.1	30.7	23.0	31.4	28.1
<i>Percent Changes in Travel Time</i>							
'00 to '05-'07	-2.2%	+0.3%	+3.5%	+8.0%	+1.5%	+10.3%	+2.7%
05-'07 to '06-'08	-1.0%	+0.1%	+0.2%	+4.7%	-0.3%	+2.1%	+0.3%
<i>Number of Resident Workers</i>							
2000	67,904	109,518	518,020	29,470	72,268	21,099	818,279
2005-2007	79,827	144,033	583,209	36,262	83,828	26,577	953,736
2006-2008	80,461	149,484	589,592	36,537	85,870	27,557	969,501
<i>Percent Changes in Number of Resident Workers</i>							
'00 to '05-'07	+17.6%	+31.5%	+12.6%	+23.0%	+16.0%	+26.0%	+16.6%
05-'07 to '06-'08	+0.8%	+3.8%	+1.1%	+0.8%	+2.4%	+3.7%	+1.7%

Source: SACOG, January 2009. Based on Year 2000 Census SF3 Tables and the 2005-2007 and 2006-2008 releases of the American Community Survey.

Figure 14. Reported Commute Time by County, Six-County Sacramento Region



Source: SACOG, January 2009. Based on Year 2000 Census SF3 Tables and the 2005-2007 and 2006-2008 releases of the American Community Survey.

Table 9. Vehicles Available Per Household, Six-County Sacramento Region

Vehicles Available	2000	2005-2007	2006-2008	2000	2005-2007	2006-2008
None	55,806	48,645	49,697	7.8%	6.0%	6.1%
One	245,302	256,220	255,840	34.4%	31.6%	31.4%
Two	281,104	321,104	325,734	39.4%	39.6%	39.9%
Three	95,395	128,072	127,970	13.4%	15.8%	15.7%
Four	25,356	40,812	40,332	3.6%	5.0%	4.9%
Five-or-more	9,903	15,541	16,493	1.4%	1.9%	2.0%
Total HH's	712,866	810,394	816,066	100.0%	100.0%	100.0%
<b>Average Auto's Per HH</b>	<b>1.75</b>	<b>1.89</b>	<b>1.89</b>	<b>1.75</b>	<b>1.89</b>	<b>1.89</b>

Source: SACOG, March 2010. Based on Year 2000 Census SF3 Tables and the 2005-2007 and 2006-2008 releases of the American Community Survey. Note on shaded cells: based on information from FHWA staff, up to 1 percent of the difference in percentage of zero-auto households may be due to difference in sample and survey methodology between the Decennial Census and ACS—i.e. the real change may be less dramatic than shown here.

## Vehicle Miles Traveled

Vehicle miles traveled (VMT) is one of the best generic indicators of the amount of vehicle travel. The measures presented here are *geographic* estimates of VMT—that is, they are estimates of total VMT which have occurred in a specific, defined geographic area<sup>11</sup>. In this case, the VMT estimates are for the six-county Sacramento region in its entirety, including all cities and other jurisdictions within the counties. The VMT estimates come from the U.S. “Highway Performance Monitoring System” data, which are generated collaboratively by the Federal Highway Administration, the state departments of transportation (including Caltrans), and local agencies. Critiques of HPMS as a data source abound, but no other credible estimates of total VMT are regularly and systematically updated, and published for specific geography.

Table 10 provides a comprehensive tally of “maintained mileage”<sup>12</sup> of roadway (part 1 of the table) and average daily VMT<sup>13</sup> (or “DVMT”, in part 2 of the table) for the six-county Sacramento region. The table presents both indicators tallied by county and by type of roadway (state highway vs. all other roadways). One striking point of comparison: while state highways are a small fraction of maintained mileage (7 percent in 2008), state highways serve 50 percent of the DVMT.

Figures 15 and 16 illustrate the allocation of DVMT by the state highway and local street roadway systems, and the allocation of DVMT by county.

Table 11 provides a more detailed tabulation of DVMT, broken down by county, along with growth and change statistics. Some notable trends:

- 1) From 2000 to 2001, DVMT dipped 2.1 percent, reflecting the effects of the tech-sector-bubble-burst and subsequent recession during that time period. A second, smaller dip (-0.2 percent) that occurred in 2005 may be attributed in part to the steep rise in gasoline prices, with prices topping \$3.00 for the first time.
- 2) Overall from 2000 to 2005, DVMT grew by 2 percent per year, slightly lower than population growth over the same period (2.6 percent).

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<sup>11</sup> Other common VMT indicators are: “per household” or “per capita” estimates, which are estimates of the rates of VMT generation by households or persons of different types, or in different locations; vehicle type estimates, which capture the amount of VMT generated by different types of vehicles (e.g. “passenger vehicles”, “heavy duty trucks”, etc.).

<sup>12</sup> “Maintained mileage” of roadway is the centerline length of all maintained roadways. For example, a one mile segment of a 2-lane rural highway would count as one maintained mile of roadway; a one mile segment of 8-lane urban freeway would also count as one maintained mile.

<sup>13</sup> HPMS reports *average daily* VMT, the intent of which is to tally up the VMT for all days in a year (weekday, weekends, holidays, etc.) and divide that VMT by 365 days. Another common VMT measure is “typical weekday” (i.e. average or typical volumes observed during weekdays when most workers are working, schools are in session, etc.). Typical weekday volumes are, in total, about 5 percent higher than average daily volumes, although some roadways have higher volumes during non-weekday periods (e.g. roadways in recreational areas).

- 3) Overall from 2005 to 2008, DVMT declined slightly, reflecting the economic recession and slowing of the regional economy.

Figure 17 illustrates DVMT per capita. From 1996 to 2000, DVMT increased steadily to over 26 miles per person per day. By 2001, DVMT per capita dropped to 25 miles per day, again reflecting the tech-sector-bubble-burst and subsequent recession. By 2003, DVMT per capita had climbed back to over 26 miles. As fuel prices increased after 2003, and the economy began to slow and shrink starting in 2007, DVMT declined steadily to 24.5 miles in 2008, lower than any time since 1996. Other contributing factors to the recent decline: increasing public transit and bike commuting (see Table 6, above) and changes in residential development type, favoring attached dwellings (see Figure 2, above)—households in attached dwelling units, all else being equal, tend to generate fewer vehicle trips and less VMT than households in detached dwellings.

**Table 10. Maintained Mileage and Daily VMT, Six-County Sacramento Region (part 1 of 2)**

County	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<i>Maintained Miles (State Highway)</i>													
El Dorado	172	172	172	172	172	182	182	182	172	168	168	168	168
Placer	156	156	156	156	156	156	156	156	156	157	156	154	154
Sacramento	226	227	227	227	227	214	214	214	214	214	214	214	214
Sutter	84	84	84	84	84	84	84	84	84	84	84	84	84
Yolo	179	179	179	179	178	178	178	178	178	178	179	178	168
Yuba	<u>65</u>	<u>64</u>	<u>64</u>	<u>64</u>	<u>66</u>	<u>64</u>	<u>64</u>	<u>64</u>	<u>64</u>	<u>64</u>	<u>65</u>	<u>64</u>	<u>64</u>
Total	881	881	881	881	883	879	878	878	868	865	865	862	852
<i>Maintained Miles (Non-State Roadways)</i>													
El Dorado	1,954	1,956	1,949	1,962	1,962	1,966	1,980	1,975	1,981	1,981	1,988	1,987	1,986
Placer	1,905	1,892	1,892	1,901	1,915	1,934	1,933	1,994	2,166	2,166	2,097	2,230	2,230
Sacramento	4,113	4,112	4,264	4,247	4,610	4,590	4,639	4,430	4,418	4,417	4,553	4,544	4,544
Sutter	989	989	989	977	984	960	1,016	996	965	965	1,024	1,026	1,026
Yolo	1,230	1,235	1,235	1,252	1,267	1,288	1,285	1,285	1,293	1,291	1,295	1,291	1,339
Yuba	<u>727</u>	<u>727</u>	<u>734</u>	<u>723</u>	<u>724</u>	<u>723</u>	<u>721</u>	<u>732</u>	<u>752</u>	<u>752</u>	<u>787</u>	<u>794</u>	<u>804</u>
Total	10,918	10,912	11,063	11,063	11,462	11,461	11,575	11,411	11,575	11,572	11,742	11,871	11,928
<i>Maintained Miles (Total)</i>													
El Dorado	2,126	2,128	2,121	2,134	2,134	2,149	2,162	2,157	2,153	2,148	2,155	2,154	2,153
Placer	2,061	2,048	2,048	2,057	2,071	2,090	2,089	2,150	2,322	2,324	2,253	2,384	2,384
Sacramento	4,339	4,339	4,491	4,474	4,836	4,804	4,853	4,644	4,632	4,631	4,767	4,758	4,758
Sutter	1,073	1,072	1,073	1,061	1,067	1,044	1,100	1,079	1,049	1,049	1,107	1,109	1,109
Yolo	1,408	1,414	1,413	1,430	1,446	1,467	1,463	1,463	1,470	1,469	1,473	1,469	1,507
Yuba	<u>792</u>	<u>792</u>	<u>798</u>	<u>788</u>	<u>790</u>	<u>787</u>	<u>786</u>	<u>796</u>	<u>816</u>	<u>816</u>	<u>852</u>	<u>858</u>	<u>869</u>
Total	11,799	11,793	11,944	11,944	12,345	12,340	12,453	12,289	12,442	12,437	12,607	12,733	12,780
Maint.Mi. Yrly Change:		-0.1%	+1.3%	+0.0%	+3.4%	-0.0%	+0.9%	-1.3%	+1.2%	-0.0%	+1.4%	+1.0%	+0.4%

Source: SACOG, March 2010. Based on "California Public Road Data" reports by the California Department of Transportation. "Maintained miles" is a measure of roadways using the centerline distance of each road segment (e.g. a 2-lane road segment of one mile in length = 1.0 lane miles; a 4-lane road segment of one mile in length = 1.0 lane miles). "Daily vehicle miles traveled" is intended to represent the total vehicle miles traveled of all roadways over the course of a year, divided by 365 days.

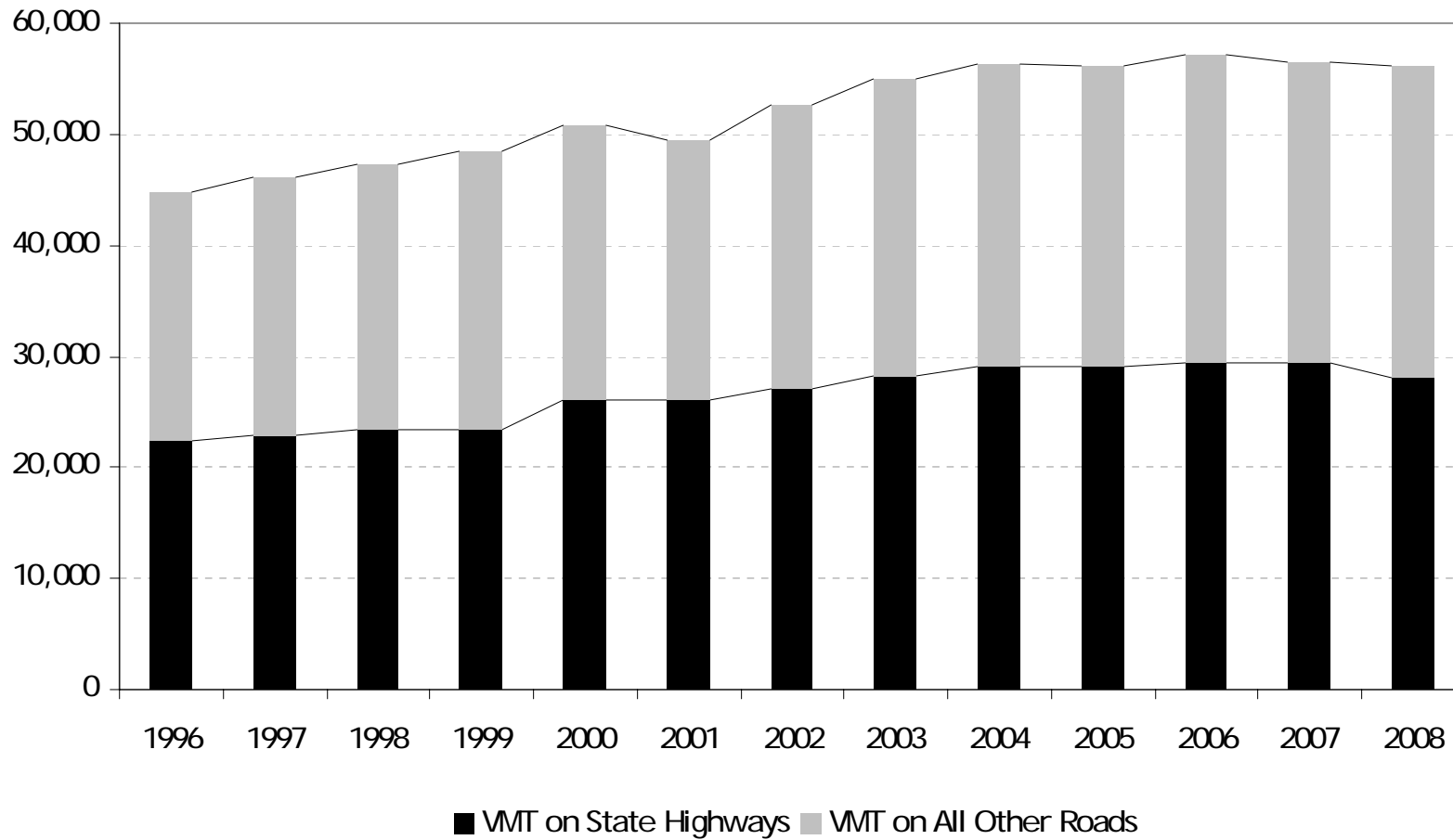
Table 10. Maintained Mileage and Daily VMT, Six-County Sacramento Region (part 2 of 2)

County	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
<i>Daily Vehicle Miles Traveled (State Highway)</i>													
El Dorado	2,137	2,133	2,226	2,226	2,313	2,554	2,600	2,638	2,516	2,421	2,460	2,392	2,332
Placer	4,016	4,123	4,256	4,256	4,738	4,649	4,936	5,309	5,495	5,303	5,366	5,323	5,090
Sacramento	11,532	11,704	12,072	12,072	13,868	13,499	13,846	14,438	14,927	15,159	15,405	15,431	14,741
Sutter	1,018	1,031	1,056	1,056	1,079	1,116	1,175	1,208	1,254	1,408	1,412	1,490	1,389
Yolo	2,973	3,123	3,098	3,098	3,257	3,482	3,634	3,838	3,911	3,830	3,890	3,797	3,595
Yuba	<u>663</u>	<u>704</u>	<u>728</u>	<u>728</u>	<u>827</u>	<u>791</u>	<u>813</u>	<u>892</u>	<u>926</u>	<u>964</u>	<u>953</u>	<u>941</u>	<u>900</u>
Total	22,339	22,818	23,436	23,435	26,081	26,090	27,003	28,322	29,029	29,085	29,486	29,373	28,048
<i>Daily Vehicle Miles Traveled (Non-State Roadways)</i>													
El Dorado	1,769	1,892	1,956	2,112	2,053	1,919	2,097	1,991	2,233	2,215	2,218	2,144	2,140
Placer	2,810	3,031	3,256	3,503	3,441	3,184	3,495	4,088	4,310	4,231	4,166	4,208	4,356
Sacramento	14,590	14,870	14,917	15,510	15,376	14,620	15,977	16,784	16,944	16,986	17,357	17,099	17,789
Sutter	901	959	1,016	1,086	1,072	983	1,146	1,049	1,001	966	1,022	1,026	1,055
Yolo	1,611	1,705	1,773	1,957	1,875	1,808	1,966	1,900	1,910	1,852	1,935	1,835	1,894
Yuba	<u>855</u>	<u>892</u>	<u>911</u>	<u>927</u>	<u>917</u>	<u>877</u>	<u>935</u>	<u>912</u>	<u>902</u>	<u>884</u>	<u>941</u>	<u>878</u>	<u>887</u>
Total	22,536	23,349	23,828	25,094	24,735	23,391	25,619	26,724	27,301	27,134	27,639	27,191	28,122
<i>Daily Vehicle Miles Traveled (Total)</i>													
El Dorado	3,905	4,024	4,182	4,338	4,366	4,473	4,697	4,629	4,749	4,636	4,678	4,536	4,472
Placer	6,826	7,153	7,512	7,758	8,179	7,834	8,431	9,397	9,805	9,534	9,532	9,531	9,447
Sacramento	26,122	26,574	26,989	27,582	29,244	28,119	29,823	31,221	31,870	32,145	32,762	32,530	32,530
Sutter	1,919	1,991	2,072	2,141	2,150	2,099	2,321	2,257	2,255	2,374	2,434	2,516	2,444
Yolo	4,584	4,828	4,871	5,055	5,132	5,290	5,600	5,738	5,821	5,683	5,824	5,632	5,489
Yuba	<u>1,518</u>	<u>1,596</u>	<u>1,639</u>	<u>1,655</u>	<u>1,745</u>	<u>1,668</u>	<u>1,749</u>	<u>1,803</u>	<u>1,828</u>	<u>1,849</u>	<u>1,894</u>	<u>1,819</u>	<u>1,787</u>
Total	44,875	46,166	47,264	48,530	50,816	49,482	52,622	55,046	56,329	56,219	57,125	56,564	56,170
DVMT Yearly Change:	+2.9%	+2.4%	+2.4%	+2.7%	+4.7%	-2.6%	+6.3%	+4.6%	+2.3%	-0.2%	+1.6%	-1.0%	-0.7%

Source: SACOG, March 2010. Based on "California Public Road Data" reports by the California Department of Transportation.

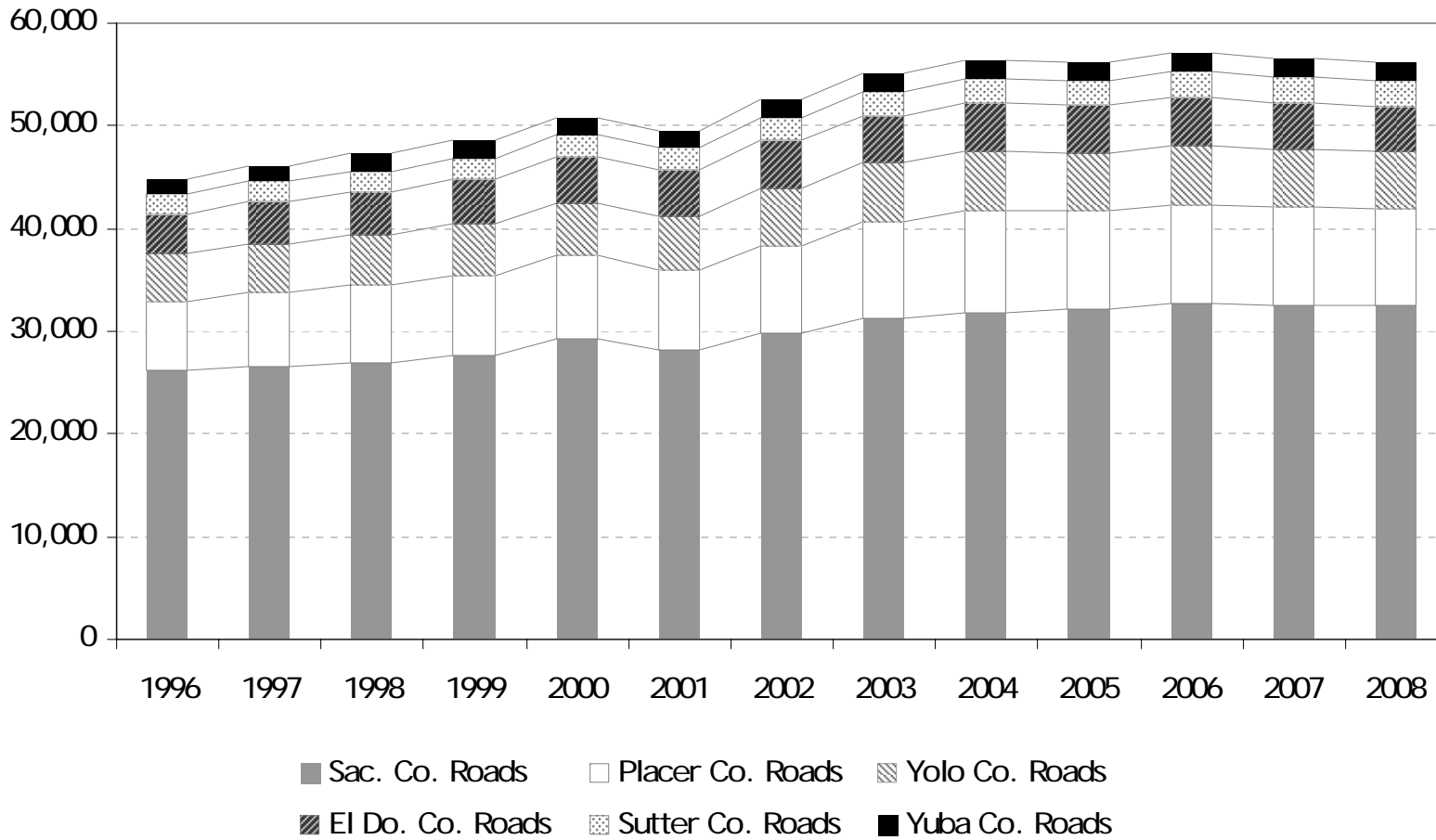
"Maintained miles" is a measure of roadways using the centerline distance of each road segment (e.g. a 2-lane road segment of one mile in length = 1.0 lane miles; a 4-lane road segment of one mile in length = 1.0 lane miles). "Daily vehicle miles traveled" is intended to represent the total vehicle miles traveled of all roadways over the course of a year, divided by 365 days.

Figure 15. Daily Vehicle Miles Traveled (000's) by State/Non-State Roadway, Six-County Sacramento Region



Source: SACOG, March 2010. Based on "California Public Road Data" reports by the California Department of Transportation.

Figure 16. Daily Vehicle Miles Traveled (000's) by County, Six-County Sacramento Region



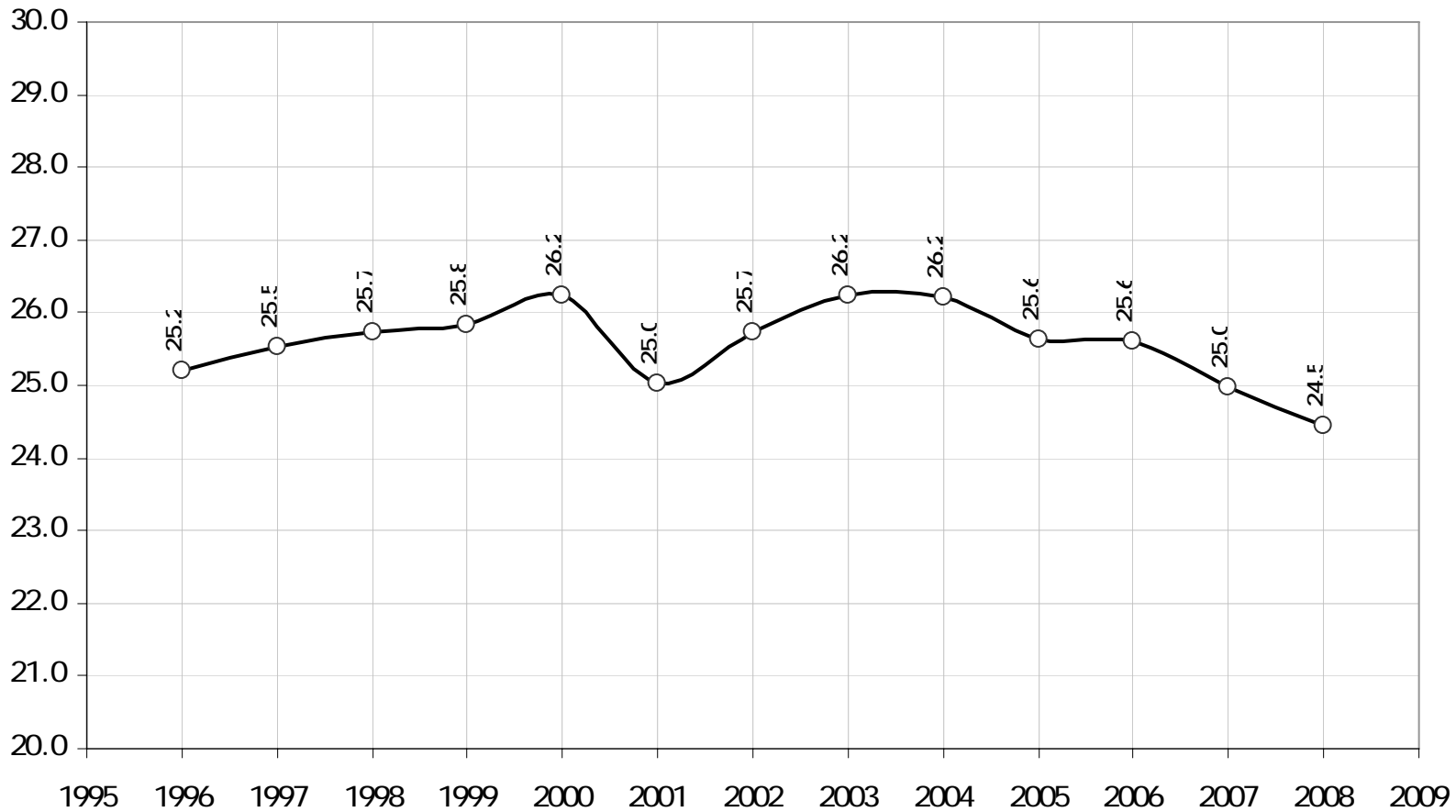
Source: SACOG, March 2010. Based on "California Public Road Data" reports by the California Department of Transportation.

**Table 11. Daily Vehicle Miles Traveled by County, 2000 to 2008, Six-County Sacramento Region**

County	2000	2001	2002	2003	2004	2005	2006	2007	2008	'00 to '05	'05 to '08	'00 to '08
<i>Daily Vehicle Miles Traveled</i>										<i>Change</i>		
El Dorado	4,366	4,473	4,697	4,629	4,749	4,636	4,678	4,536	4,472	+270	-163	+106
Placer	8,179	7,834	8,431	9,397	9,805	9,534	9,532	9,531	9,447	+1,355	-87	+1,267
Sacramento	29,244	28,119	29,823	31,221	31,870	32,145	32,762	32,530	32,530	+2,901	+385	+3,287
Sutter	2,150	2,099	2,321	2,257	2,255	2,374	2,434	2,516	2,444	+223	+71	+294
Yolo	5,132	5,290	5,600	5,738	5,821	5,683	5,824	5,632	5,489	+550	-193	+357
Yuba	<u>1,745</u>	<u>1,668</u>	<u>1,749</u>	<u>1,803</u>	<u>1,828</u>	<u>1,849</u>	<u>1,894</u>	<u>1,819</u>	<u>1,787</u>	<u>+104</u>	<u>-61</u>	<u>+43</u>
Total	50,816	49,482	52,622	55,046	56,329	56,219	57,125	56,564	56,170	+5,403	-49	+5,354
<i>Year-over-Year Percent Change</i>										<i>Ann. Avg. % Change</i>		
El Dorado		+2.5%	+5.0%	-1.5%	+2.6%	-2.4%	+0.9%	-3.0%	-1.4%	+1.2%	-1.2%	+0.3%
Placer		-4.2%	+7.6%	+11.5%	+4.3%	-2.8%	-0.0%	-0.0%	-0.9%	+3.1%	-0.3%	+1.8%
Sacramento		-3.8%	+6.1%	+4.7%	+2.1%	+0.9%	+1.9%	-0.7%	--	+1.9%	+0.4%	+1.3%
Sutter		-2.4%	+10.6%	-2.7%	-0.1%	+5.3%	+2.5%	+3.4%	-2.8%	+2.0%	+1.0%	+1.6%
Yolo		+3.1%	+5.9%	+2.5%	+1.5%	-2.4%	+2.5%	-3.3%	-2.5%	+2.1%	-1.1%	+0.8%
Yuba		<u>-4.4%</u>	<u>+4.9%</u>	<u>+3.1%</u>	<u>+1.4%</u>	<u>+1.1%</u>	<u>+2.5%</u>	<u>-4.0%</u>	<u>-1.7%</u>	<u>+1.2%</u>	<u>-1.1%</u>	<u>+0.3%</u>
Total		-2.6%	+6.3%	+4.6%	+2.3%	-0.2%	+1.6%	-1.0%	-0.7%	+2.0%	-0.0%	+1.3%
Population Change		+2.1%	+3.5%	+2.7%	+2.4%	+2.1%	+1.8%	+1.5%	+1.4%	+2.6%	+1.6%	+2.2%
Maint. Mileage Ch.		-0.1%	+1.3%	+0.0%	+3.4%	-0.0%	+0.9%	-1.3%	+1.2%	+0.1%	+0.9%	+0.4%

Source: SACOG, March 2010. Based on "California Public Road Data" reports by the California Department of Transportation. Population change percentages from California Department of Finance population estimates.

Figure 17. Daily Total Vehicle Miles Per Capita, 1996 to 2008, Six-County Sacramento Region



Source: SACOG, March 2010. Based on "California Public Road Data" reports by the California Department of Transportation, and household population estimates from the California Department of Finance.

## Congestion

“Traffic congestion” is a term which elicits an almost-universal negative reaction from travelers—nobody likes to be stuck in traffic. However, objective definitions of what constitutes congestion are few. Here, the two sources used for tracking congestion are the Caltrans District 3 annual congestion monitoring reports and the “Urban Mobility” reports published annually by the Texas Transportation Institute (TTI).

### *Caltrans District 3 Congestion Monitoring*

Caltrans District 3 has done annual field measurement of congestion on the state highways in the Sacramento area since 1995<sup>14</sup>. This dataset is unique in the Sacramento area in that it is: 1) collected annually; 2) based on a consistent, objective definition of congestion; and 3) measured using reasonably robust techniques. No other agency in the Sacramento region does congestion monitoring that comes close to meeting all three criteria. *Special note: Due to budget cuts, no congestion monitoring field measurement will be conducted by Caltrans District 3 in 2009.*

The definition of congestion applied by Caltrans is:

- State highways which experience average travel speeds below 35 MPH for 15 or more minutes.
- For this reporting, Caltrans focuses on recurrent congestion, which is defined as travel conditions generated by demand which exceeds capacity on roadways, and thereby results in slower travel speeds. Caltrans attempts to exclude the effect of non-recurrent conditions (i.e. traffic accidents, roadway blockages, construction activities, etc.) from their measurement.
- The amount of delay which springs from congestion is defined as the difference in travel time between the actual travel time with congestion, and the travel time which would be experienced at 35 MPH travel speed. In the Caltrans measure, delay accrues to vehicles, not to occupants of vehicles. For example:
  - Say a one-mile segment of freeway experiences average travel speed of 20 MPH for a period of one hour. The actual travel time for that one mile segment is **3 minutes**.
  - At 35 MPH, the travel time over the same segment would be **1.71 minutes**.
  - The delay for each vehicle traveling that one mile segment would be **1.29 minutes** (3 minus 1.71).
  - If the segment served a volume of 6,000 vehicles during that one hour period, the total vehicle delay for that segment would be 129 hours (1.29 minutes of delay X 6,000 vehicles = 7,740 minutes of delay, or 129 hours of delay).

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<sup>14</sup> “Caltrans District 3 Highway Congestion Monitoring Program Report (HICOMP) for the Sacramento Metropolitan Area.”

Figure 18 and Table 12 shows the measured daily vehicle delay for state highways in the Sacramento region based on the definition and measurement approach described above. Some highlights:

- Total daily vehicle delay peaked in 2005 at 21,800 hours.
- The latest year of measured delay (2008) was comparable in total to 2000.
- Looking at the entire period between 2000 and 2008, total delay has only increased by 6 percent in total, or an average annual change of 0.8 percent; however:
  - Between 2000 and 2005, the average annual delay *increases* were near 15 percent.
  - Between 2005 and 2008, the average annual delay *decreases* were near 20 percent.
- In general, in times when the amount of travel (measured by daily VMT) is changing, the changes in delay track the changes in daily VMT (i.e. they increase or decrease together). However, the changes in delay are 5 to 15 times greater than the changes to daily VMT:
  - Between 2000 and 2005, daily VMT on the state highways increased at 2.2 percent per year, compared to 15 percent annual increases in delay (i.e. delay increases were nearly seven times greater than daily VMT).
  - Between 2005 and 2008, daily VMT on the state highways decreased at 1.2 percent per year, compared to near 20 percent decreases in delay (i.e. delay decreases were 16 times greater than the daily VMT decreases).
  - This relationship (i.e. changes in delay being much greater than changes in demand) is illustrative of a unique characteristic of congestion:
    - Levels of congestion are defined “at the margins”; in other words, a roadway operating just below its capacity may have surprisingly good traffic flow. Each vehicle added as a roadway reaches capacity causes a disproportionately large decrease in travel speed and increase in delay; and
    - The marginal change in travel time as roadways reach, then exceed, capacity affects all vehicles on that roadway, not just the “last added” vehicle.
    - The combined effects of these two characteristics of congested travel serve to make it more highly variable than the amount of travel, measured by daily VMT.
- The route with the largest increase in delay between 2000 and 2008 was Business 80/Capital City Freeway (+ 9 percent).
- US-50 delay increased the most between 2000 and 2005 (+ 20.3 percent) and also dropped the most sharply between 2005 and 2008 (-23.1 percent).

### *Texas Transportation Institute's "Urban Mobility" Reports*

TTI has annually published their own estimates of congestion in 90 of the largest urban areas in the U.S., including Sacramento<sup>15</sup>. It is important to keep in mind that the congestion and delay estimates included in the TTI report are not actual, direct, field measurements of congestion in 90 different areas. TTI collects available data on transportation systems (e.g. lane miles of roadway of different types, VMT using those roadways, etc.) and estimates congestion and delay using very sophisticated formulas and calculations. In short, to the degree that growth in system demand (e.g. VMT) exceeds growth in system supply (e.g. lane miles of roadway), the TTI estimate of congestion is likely to increase, all other factors held constant. The advantages of the TTI estimates are: 1) updates are prepared annually, so it is possible to track changes over time; 2) TTI have worked diligently to validate the estimates they produce; and 3) because TTI prepares estimates for 90 urban areas, its possible to see how Sacramento compares to other areas. Also, TTI's data includes both freeway and surface streets.

The key measures of interest related to congestion provided in the TTI reports are:

- "Total traveler delay", which is defined as the difference in time between an estimate of peak period travel time and the "free flow time". For freeways, the free flow time is defined as one minute per mile (60 MPH); for arterial streets, it is defined as 1.7 minutes per mile (35 MPH). The delay is factored up to travelers (not vehicles as with the Caltrans delay measure), but it is a relatively simple scaling (average vehicle volume X 1.25).
- "Total traveler delay per traveler" is the delay hours divided by the number of travelers during the peak (compared to Caltrans, which measures delay by the number of vehicles).

TTI reports many other delay measures; however, the above measures are the most straightforward and are presented in tables and figures below.

Figure 19 shows total annual traveler delay (bars, left axis of graph), and average delay per traveler (line, right axis). TTI's estimates show total delay peaking in 2006 (compared to 2005 for the Caltrans data), with a decline in total delay between 2006 and 2007. Hours of delay per traveler peaks in 2005. Also, delay per traveler is relatively flat over the years shown, ranging from a low of about 34 hours per traveler per year in 1998 and 1999, to 43 hours per traveler in 2005.

Figure 20 shows a comparison of Sacramento to other relatively fast growing urban areas. The presentation of data bears some explanation: The X (horizontal) axis is urban area population; the Y (vertical) axis is estimated hours of delay per traveler per year. The time series for each urban area shown is 1995-2000-2005-2007. Because each of the areas is growing over this time series, the points spread out horizontally to varying degrees for each series. Urban areas which spread out widely (e.g. Sacramento and Atlanta) grew more over the time series; areas which did not grow as much (e.g. San Diego) do not spread out as widely horizontally. On the delay per

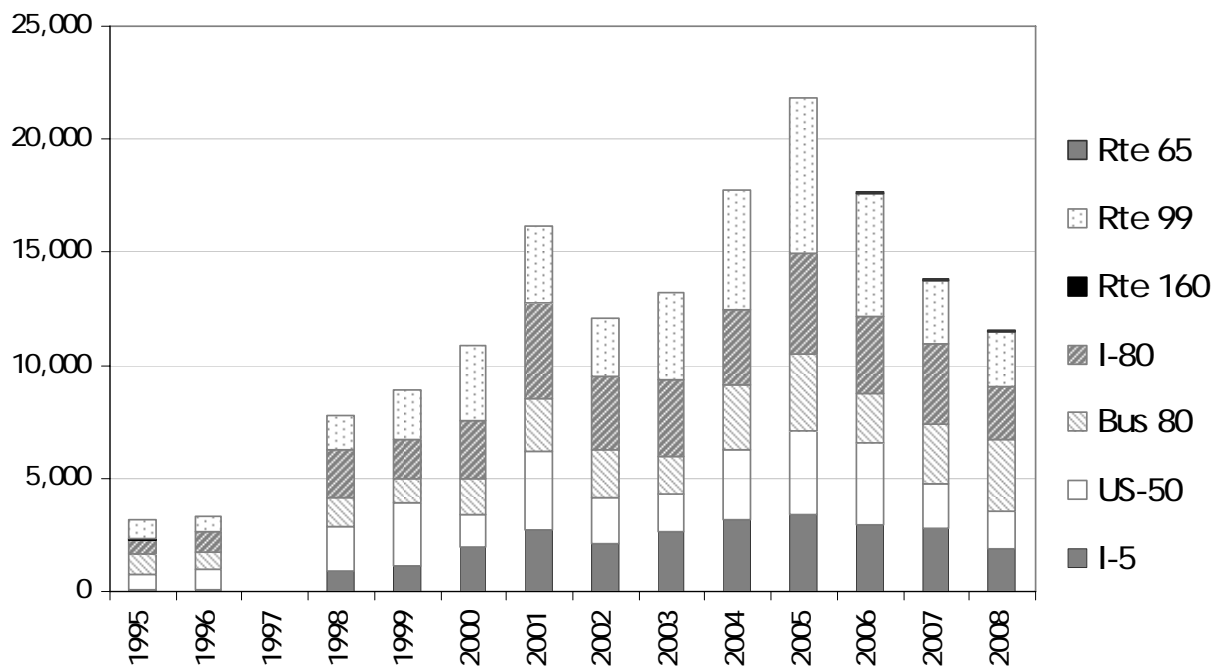
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<sup>15</sup> Reports, data and methodology available at "[http://mobility.tamu.edu/ums/congestion\\_data/](http://mobility.tamu.edu/ums/congestion_data/)"

traveler (vertical) axis, the points spread out widely for areas where delay per passenger increased significantly over the time series.

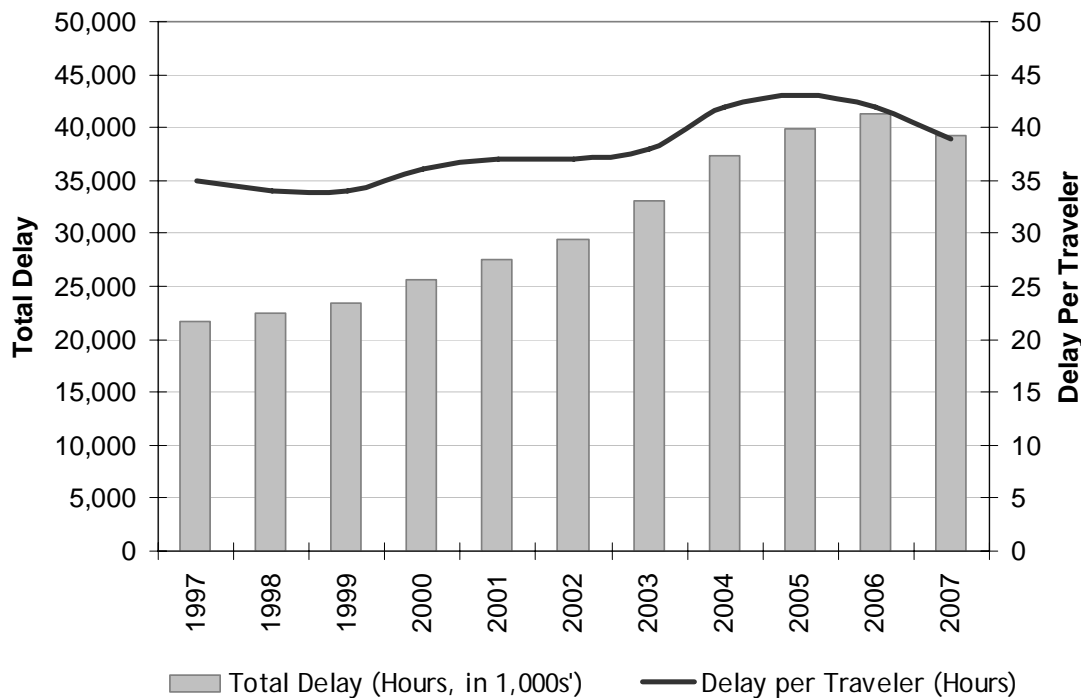
- In general, Sacramento falls into the flatter, low-sloped group, for which large population growth did not translate into similarly large increases in delay per traveler.
- San Diego is the best example of an area with relatively small population growth, but a sharp increase in delay per traveler—the time series line is the steepest for this area.

Figure 18. Weekday Vehicle Hours of Delay on State Routes, 1995 to 2008



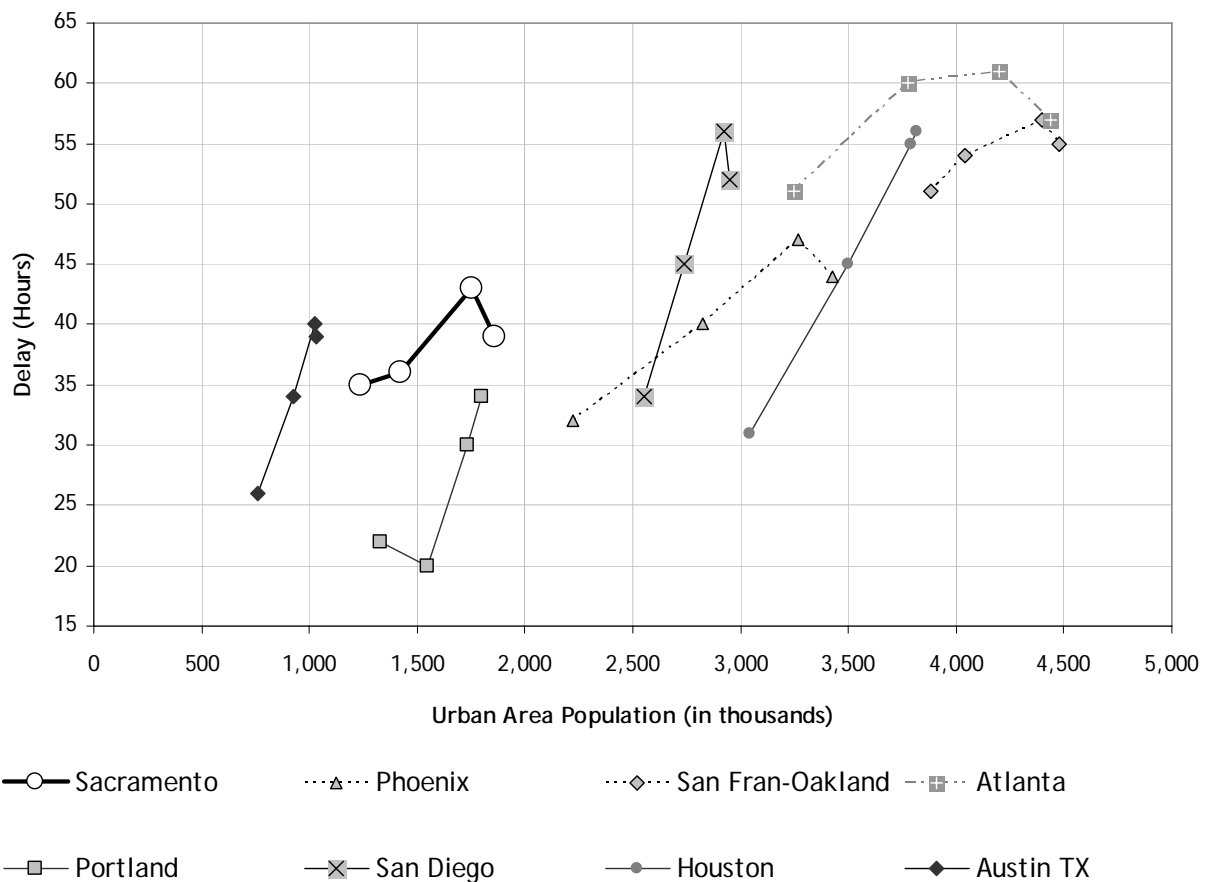
Source: SACOG, March 2010. Based on Caltrans District 3 annual congestion monitoring reports.

Figure 19. Annual Traveler Delay in the Sacramento Urbanized Area, 1997 to 2007



Source: SACOG, March 2010. Based on published information from the "Urban Mobility Reports" by the Texas Transportation Institute.

**Figure 20. Population Growth and Annual Delay Per Traveler:  
Comparison of Selected Urban Areas for 1995, 2000, 2005, and 2007**



Source: SACOG, March 2010. Based on data reported in Texas Transportation Institute’s “Urban Mobility Reports”.

**Notes for Figure 20:**

- The 1995-2000-2005-2007 time series for each urban area can be shown in the four data points.
- Steeper series (e.g. Austin, Portland, San Diego, Houston) show higher growth in delay per traveler, relative to population growth.
- Less steep series (e.g. Sacramento, Phoenix, Atlanta) show higher growth in population, relative to change in delay per traveler.
- Most areas showed a drop in congestion per traveler between 2005 and 2007 (Austin, Sacramento, San Diego, Phoenix, Atlanta, San Francisco-Oakland).

**Table 12. Weekday Vehicle Delay on State Highways in Sacramento, 1995 to 2008**

Year/1/	Route								Daily VMT on State Highways (in 1000's) /2/
	I-5	US-50	Bus. 80	I-80	Rte. 160	Rte. 99	Rte. 65	Total	
1995	80	692	884	640	24	852	0	3,172	n/a
1996	60	896	804	892	4	700	0	3,356	22,339
1997	0	0	0	0	0	0	0	0	22,818
1998	926	1,982	1,254	2,114	0	1,534	0	7,809	23,436
1999	1,111	2,825	1,052	1,700	6	2,212	0	8,907	23,435
2000	1,928	1,468	1,620	2,532	0	3,348	0	10,896	26,081
2001	2,692	3,524	2,336	4,184	8	3,456	0	16,200	26,090
2002	2,148	1,984	2,152	3,200	0	2,596	0	12,080	27,003
2003	2,676	1,630	1,628	3,464	0	3,828	0	13,226	28,322
2004	3,162	3,138	2,858	3,328	0	5,226	0	17,712	29,029
2005	3,400	3,698	3,366	4,514	0	6,853	0	21,832	29,085
2006	2,923	3,636	2,178	3,387	0	5,468	56	17,648	29,486
2007	2,767	2,008	2,658	3,495	0	2,817	83	13,827	29,373
2008	1,852	1,680	3,220	2,332	0	2,428	64	11,576	28,048
<i>Year-to-Year Percent Changes</i>									
2000 to 2005	+76.3%	+151.9%	+107.8%	+78.3%	n/a	+104.7%	n/a	+100.4%	+11.5%
2005 to 2008	-45.5%	-54.6%	-4.3%	-48.3%	n/a	-64.6%	n/a	-47.0%	-3.6%
2000 to 2008	-3.9%	+14.4%	+98.8%	-7.9%	n/a	-27.5%	n/a	+6.2%	+7.5%
<i>Annual Average % Changes</i>									
2000 to 2005	+12.0%	+20.3%	+15.8%	+12.3%	n/a	+15.4%	n/a	+14.9%	+2.2%
2005 to 2008	-18.3%	-23.1%	-1.5%	-19.8%	n/a	-29.2%	n/a	-19.1%	-1.2%
2000 to 2008	-0.5%	+1.7%	+9.0%	-1.0%	n/a	-3.9%	n/a	+0.8%	+0.9%

Source: SACOG, March 2010. Based on Caltrans District 3 annual congestion monitoring reports.

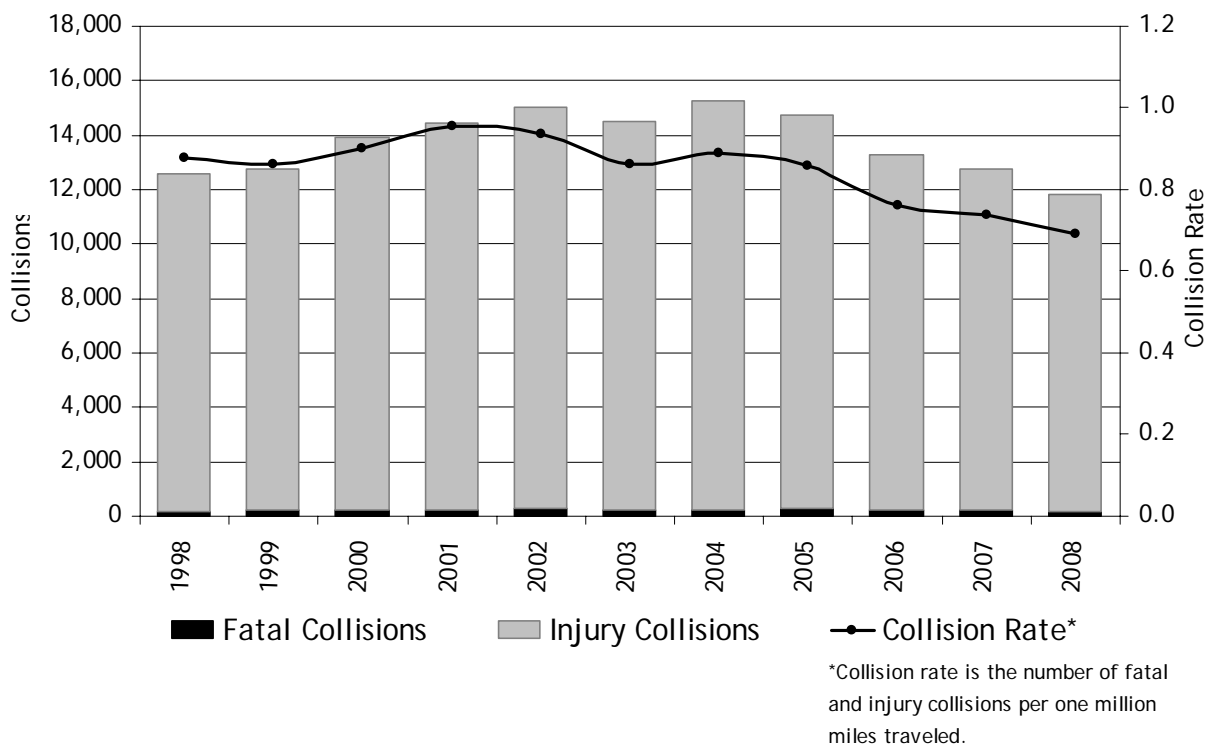
/1/ Caltrans District 3 did not perform congestion monitoring fieldwork in 1997.

/2/ From Caltrans Public Road Data reports, as shown on Table 11 above.

## Collisions and Safety

Serious traffic collisions are one measure of safety of travel on roadways. The total number of fatal or injury collisions reported in the Six-County Sacramento Region for the eleven years leading up to 2008 is shown in Figure 21. The total number of fatal or injury collisions peaked between 2002 and 2004, and has declined for every year since 2004. Normalized to VMT, the decline since 2004 is very steep, averaging 6 percent per year. Obviously, this downward trend in the overall collision rate is no argument for complacency, and all agencies must continue to put safety as a top priority in planning, design, construction, operation, and maintenance of facilities. Additionally, locations where collision rates exceed averages continue to merit attention by local agencies and operators, irrespective of the regional trend.

**Figure 21. Fatal and Injury Collisions, 1998 to 2008  
Six-County Sacramento Region**



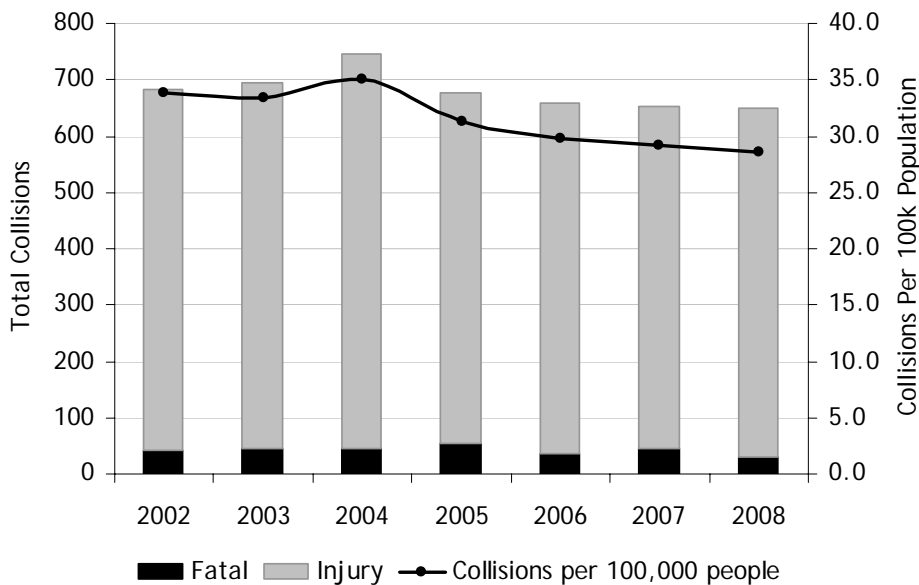
Source: SACOG, March 2010. Based on "Annual Report(s) of Fatal and Injury Motor Vehicle Traffic Collisions" by the California Highway Patrol.

Figures 22 and 23 provide data on pedestrian-involved and bicycle-involved collisions in the Six-County Sacramento Region. Total fatal or injury collisions were normalized to VMT (see Figure 21), because VMT is considered to be the best indicator of “exposure” to potential accidents for motor vehicle travelers. There is no such exposure data source for pedestrian- or bicycle- involved collisions. Ideally, one would want to normalize the number of collisions involving pedestrians or bicyclists with the actual number of pedestrians or bicyclists using the region’s transportation system. As mentioned above in the report, there is not reliable, regional data source for travel by mode, other than commute travel, which is tracked through the Census and American Community Survey. Lacking any good measure of exposure, pedestrian- and bicycle- involved collisions were normalized to population, and shown in Figures 22 and 23 as collisions-per-100,000-residents.

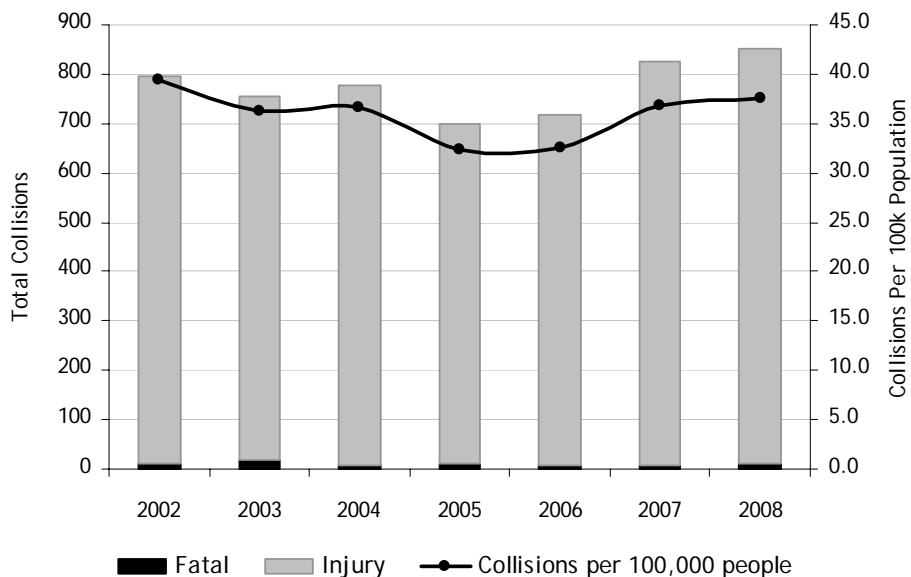
Figure 22 shows that both total and per-capita pedestrian involved collisions have declined, at least since 2004, in the Six-County Sacramento Region. This trend could be due to many factors, including: 1) reduced numbers of pedestrians on the region’s transportation system (i.e. reduced exposure); 2) changes in driver or pedestrian behavior which have reduced accidents; or 3) improvements to the region’s pedestrian or roadway facilities which have reduced the potential for collisions between pedestrians and vehicles. Any or all of these factors could explain the trend, and with the data available in this report, there is no way to decisively explain it.

Figure 23 shows bicycle-involved collisions and collisions-per-100,000-residents, similar in format to Figure 22. Total and normalized collisions both decline from 2002 to 2005, then increase to 2008. The interpretation of the changes is subject to the same limitations and caveats as the pedestrian-involved collisions.

**Figure 22. Pedestrian-Involved Fatal and Injury Collisions, 2002 to 2008  
Six-County Sacramento Region**



**Figure 23. Bicycle-Involved Fatal and Injury Collisions, 2002 to 2008  
Six-County Sacramento Region**



Source: SACOG, March 2010. Based on "Annual Report(s) of Fatal and Injury Motor Vehicle Traffic Collisions" by the California Highway Patrol.

## Transit Service and Ridership

Transit commute share was discussed above; this section is primarily devoted to documenting changes and trends in provision of transit service. Although transit mode share is a better measure of the effectiveness of transit in providing an alternative to driving, since it accounts for changes in other modes and focuses on entire trips rather than just trip segments, the absolute number and changes in the number of transit passenger boardings is a useful indication of shorter term changes in ridership.

Tables 13 and 14 provide tabulations of fixed-route “vehicle service hours” (or VSH) and “vehicle service miles” (or VSM) for most operators in the six-county Sacramento region, not counting the Tahoe Basin portions of Placer and El Dorado counties. Fixed route service is the scheduled service which operates on known, published routes and stops. Fixed route service is generally open to the public, and does not restrict who can ride the service. Fixed route service excludes “demand response” and most shuttle services, which vary in schedule and route during the course of the day, and in some cases, serve select populations or individuals.

A VSH is the primary measure of the quantity of service offered by an operator. One VSH, for purposes of the following tables and figure, is one transit vehicle operating in revenue service (i.e. serving a route which picks up and drops off passengers, rather than a “deadhead” return to the start of the next scheduled run) for one hour. Depending on the type of transit, the amount of distance covered in that hour varies widely; a fixed route bus operating in a congested, urban area may cover 20 miles (a.k.a. “vehicle service miles” or “VSM”); a commuter bus may cover 40 or 50 miles in that same VSH. By the same token, that urban route covering 20 miles in one VSH may stop to pick up or drop off passengers 30 or 40 times, and may serve 70 or 80 passengers, while the commuter bus, which may be routed along a freeway for 20 or 30 miles, may stop only five or six times in that same hour, and service 20 or 30 passengers.

Service provision breaks down generally into to sub-periods between 2002 and 2008:

- 1) Service between 2002 and 2005, in which total VSH for all operators increased by +8.8 percent per year and total VSM increased by nearly +5 percent per year; and
- 2) Service between 2005 and 2008, in which VSH declines at an average rate of - 0.2 percent per year.

Good examples of the former time period increases are: Sacramento Regional Transit, which increased light rail service hours by 23.8 percent (reflecting the beginning of service on the Southerly extension of the Blue Line to Meadowview, the beginning of LRT service to the City of Folsom, and the extension of LRT from St. Rose of Lima to the Sacramento Valley Station in Downtown); and Placer County Transit and Roseville Transit, which increased fixed route bus service by 9.8 and 7.7 percent, respectively (largely through additions of commuter routes).

A good example of the latter time period (2005 to 2008) decline is Sacramento Regional Transit (for which a slight increase in LRT service was overwhelmed by a larger decrease in bus VSH).

The causes of the latter declines primarily have to do with service cuts necessitated by declines in revenue, such as raids of TDA revenues by the State, and the decline in local sales taxes, which are dedicated to transit operations.

Other operators' service declined for other reasons. For example, between 2005 and 2008, Folsom Stage Line's VSH decreased by nearly 7 percent and VSM decreased by nearly 19 percent, largely because Folsom discontinued commuter buses to Downtown Sacramento starting in 2005 when the LRT extension to Folsom started began.

Table 15 provides a similar tabulation of passenger boardings by operator. For both the 2002 to 2005 and 2005 to 2008, passenger boardings increased (by 5 percent and 2.2 percent, respectively). Light rail is the only operator/service type which increased by double-digit percentages during both periods.

Figures 24 through 26 provide a graphical representation of the service and ridership statistics in Tables 13 to 15.

Table 16 and Figures 25 through 27 provide "per capita" trendlines for service and ridership.

Figure 27 shows annual vehicle service hours provided per capita. Some highlights:

- Service hours per capita peaked in 2005, at 0.58 hours. This peak is nearly 20 percent above 2002 level.
- Since 2005, service hours per capita have declined 5 percent, to 0.55 hours.

Figure 28 shows the per capita trendline for vehicle service miles:

- Service miles per capita climbed from about 7.4 miles in 2002 to 7.98 miles in 2004, and has varied between 7.8 and 8.0 since 2004.
- Information on Table 16 shows that bus service miles have shown an overall decline from 2002 to 2008; the increase is primarily due to light rail service miles being added in 2003 (South Line opening) and 2005 (Folsom Extension).

Figure 29 shows passenger boardings per capita:

- Boardings per capita increased sharply from 2002 to 2004, increasing from 16.2 to 17.6. Most of this increase was due to LRT boardings (see Table 16).
- Since 2004, boardings per capita dropped slightly to 17.2 in 2006, then increased to 17.7 in 2008. Based on limited data available before 2000, 17.7 is very likely to be the historic high in boardings per capita in the region.
- During the time from 2005 to 2008, bus boardings per capita decreased, while LRT boardings per capita increased. Table 16 shows that much of the overall

increase over the period from 2002 to 2008 was due to increases in LRT boardings.

Figures 30 and 31 provide simple measures of transit productivity: passenger boardings per vehicle service hour, and passenger boardings per vehicle service mile.

- Passenger boardings per service hour peaked in 2003 at 34.6 and were lowest in 2005 at 29.7. Since the low, boardings per service hour have increased steadily to 32.0 in 2008.
- Passenger boardings per service mile have varied around 2.2, with a high of 2.27 in 2003 and a low of 2.17 in 2007.

**Table 13. Annual Fixed Route Vehicle Service Hours by Operator, 2002 to 2008**

Operator	2002	2003	2004	2005	2006	2007	2008	Ann. Avg. % Change	
								'02 to '05	'05 to '08
Auburn Transit	5,355	5,490	5,304	4,652	4,780	5,160	4,653	-4.6%	+0.0%
Delta Breeze	180	115	154	159	446	385	563	-4.1%	+52.4%
El Dorado Transit	23,289	22,110	22,054	21,022	21,311	30,759	31,161	-3.4%	+14.0%
Folsom	10,719	12,375	12,555	14,654	12,487	11,479	11,910	+11.0%	-6.7%
Lincoln Transit	4,457	4,588	5,588	4,394	6,232	5,588	4,618	-0.5%	+1.7%
Placer County Trn	17,361	17,501	23,338	22,962	23,710	23,714	25,999	+9.8%	+4.2%
Roseville Transit	34,953	36,498	39,935	43,653	43,475	42,965	41,139	+7.7%	-2.0%
SRTD Fixed Route	600,925	614,707	696,714	749,023	710,921	702,797	677,676	+7.6%	-3.3%
SRTD Light Rail**	<u>103,693</u>	<u>105,752</u>	<u>149,763</u>	<u>197,255</u>	<u>208,854</u>	<u>209,725</u>	<u>215,947</u>	<u>+23.9%</u>	<u>+3.1%</u>
SRTD Total	704,618	720,459	846,477	946,278	919,775	912,522	893,623	+10.3%	-1.9%
SCT/LINK	11,646	10,293	10,743	10,500	17,805	19,639	19,612	-3.4%	+23.2%
Unitrans	60,676	65,244	70,912	70,823	71,288	70,335	68,477	+5.3%	-1.1%
Yolobus	58,878	61,188	64,981	70,569	74,878	88,653	92,813	+6.2%	+9.6%
Yuba-Sutter Trn.	<u>43,129</u>	<u>44,556</u>	<u>45,745</u>	<u>44,715</u>	<u>44,651</u>	<u>47,946</u>	<u>50,496</u>	<u>+1.2%</u>	<u>+4.1%</u>
All Operators	975,261	1,000,417	1,147,786	1,254,381	1,240,838	1,259,145	1,245,064	+8.8%	-0.2%

Source: SACOG, March 2010. Based on the data from the State Controller’s Office annual reports, Triennial Performance Audits, the National Transit Database, and from reports and data provided directly by transit operators. Population data from California Department of Finance.

\*Revenue service hours, not total miles and hours. Totals exclude E-Tran, which was missing data for many years in the series.

\*\*LRT service hours and miles are for vehicles, not consists; e.g. a 2-vehicle consist traveling for 30 miles at 30mph generates 60 VSM and 2 VSH.

**Table 14. Annual Fixed Route Vehicle Service Miles by Operator, 2002 to 2008**

Operator	2002	2003	2004	2005	2006	2007	2008	Ann. Avg. % Change	
								'02 to '05	'05 to '08
Auburn Transit	62,680	61,862	64,196	60,635	61,444	62,070	62,924	-1.1%	+1.2%
Delta Breeze	1,702	1,281	1,729	1,690	6,773	7,041	7,796	-0.2%	+66.5%
El Dorado Transit	588,777	688,747	566,738	496,666	495,387	668,075	677,864	-5.5%	+10.9%
Folsom	273,965	294,652	365,268	298,855	190,960	162,185	161,652	+2.9%	-18.5%
Lincoln Transit	50,129	52,818	71,716	50,869	66,081	71,716	48,721	+0.5%	-1.4%
Placer County Trn	445,870	472,405	509,683	488,164	505,896	523,225	572,983	+3.1%	+5.5%
Roseville Transit	527,387	555,467	615,152	691,335	677,495	642,426	619,057	+9.4%	-3.6%
SRTD Fixed Route	7,738,128	7,922,888	8,566,453	8,238,964	7,687,674	7,637,823	7,430,729	+2.1%	-3.4%
SRTD Light Rail**	<u>2,128,498</u>	<u>2,170,991</u>	<u>2,878,822</u>	<u>3,429,277</u>	<u>3,888,222</u>	<u>4,127,718</u>	<u>4,266,965</u>	<u>+17.2%</u>	<u>+7.6%</u>
SRTD Total	9,866,626	10,093,879	11,445,275	11,668,241	11,575,896	11,765,541	11,697,694	+5.7%	+0.1%
SCT/LINK	286,037	286,669	291,243	292,996	392,853	441,158	449,186	+0.8%	+15.3%
Unitrans	644,320	700,388	752,243	751,823	752,515	736,797	704,711	+5.3%	-2.1%
Yolobus	1,291,242	1,307,439	1,300,951	1,519,522	1,641,259	1,881,257	1,979,185	+5.6%	+9.2%
Yuba-Sutter Trn.	<u>745,236</u>	<u>764,809</u>	<u>748,070</u>	<u>747,717</u>	<u>738,030</u>	<u>770,839</u>	<u>818,525</u>	<u>+0.1%</u>	<u>+3.1%</u>
All Operators	14,783,971	15,280,416	16,732,264	17,068,513	17,104,589	17,732,330	17,800,298	+4.9%	+1.4%

Source: SACOG, March 2010. Based on the data from the State Controller’s Office annual reports, Triennial Performance Audits, the National Transit Database, and from reports and data provided directly by transit operators. Population data from California Department of Finance.

\*Revenue service hours, not total miles and hours. Totals exclude E-Tran, which was missing data for many years in the series.

\*\*LRT service hours and miles are for vehicles, not consists; e.g. a 2-vehicle consist traveling for 30 miles at 30mph generates 60 VSM and 2 VSH.

**Table 15. Annual Fixed Route Passenger Boardings by Operator, 2002 to 2008**

Operator	2002	2003	2004	2005	2006	2007	2008	Ann. Avg. % Change	
								'02 to '05	'05 to '08
Auburn Transit	46,463	37,005	51,339	50,601	56,472	62,221	57,064	+2.9%	+4.1%
Delta Breeze	18	12	16	10	315	590	891	-17.8%	+346.6%
El Dorado Transit	224,989	234,384	240,085	240,525	253,776	287,954	341,667	+2.3%	+12.4%
Folsom	134,957	136,090	146,058	141,179	81,969	71,802	79,028	+1.5%	-17.6%
Lincoln Transit	25,877	22,764	24,971	22,378	25,684	30,730	29,226	-4.7%	+9.3%
Placer County Trn	189,963	215,578	247,565	236,590	256,370	283,180	324,535	+7.6%	+11.1%
Roseville Transit	333,280	326,906	344,743	345,406	367,127	373,425	371,142	+1.2%	+2.4%
SRTD Fixed Route	18,068,907	19,756,481	19,446,782	18,929,374	16,777,640	17,461,487	17,465,817	+1.6%	-2.6%
SRTD Light Rail**	<u>8,541,086</u>	<u>8,859,032</u>	<u>11,022,004</u>	<u>12,008,620</u>	<u>14,452,137</u>	<u>14,489,691</u>	<u>15,484,670</u>	<u>+12.0%</u>	<u>+8.8%</u>
SRTD Total	26,609,993	28,615,513	30,468,786	30,937,994	31,229,777	31,951,178	32,950,487	+5.2%	+2.1%
SCT/LINK	42,358	45,996	49,608	52,128	73,277	85,574	82,912	+7.2%	+16.7%
Unitrans	2,732,188	3,142,492	3,450,060	3,416,432	3,272,383	3,173,916	3,186,916	+7.7%	-2.3%
Yolobus	1,303,451	1,307,439	1,201,197	1,230,312	1,307,400	1,362,732	1,485,322	-1.9%	+6.5%
Yuba-Sutter Trn.	<u>564,002</u>	<u>562,336</u>	<u>583,872</u>	<u>618,034</u>	<u>671,650</u>	<u>757,136</u>	<u>876,176</u>	<u>+3.1%</u>	<u>+12.3%</u>
All Operators	32,207,539	34,646,515	36,808,300	37,291,589	37,596,200	38,440,438	39,785,366	+5.0%	+2.2%

Source: SACOG, March 2010. Based on the data from the State Controller’s Office annual reports, Triennial Performance Audits, the National Transit Database, and from reports and data provided directly by transit operators. Population data from California Department of Finance.

\*Revenue service hours, not total miles and hours. Totals exclude E-Tran, which was missing data for many years in the series.

\*\*LRT service hours and miles are for vehicles, not consists; e.g. a 2-vehicle consist traveling for 30 miles at 30mph generates 60 VSM and 2 VSH.

**Table 16. All-Operators Fixed Route Transit Service and Ridership, 2002 to 2008, Six-County Sacramento Region**

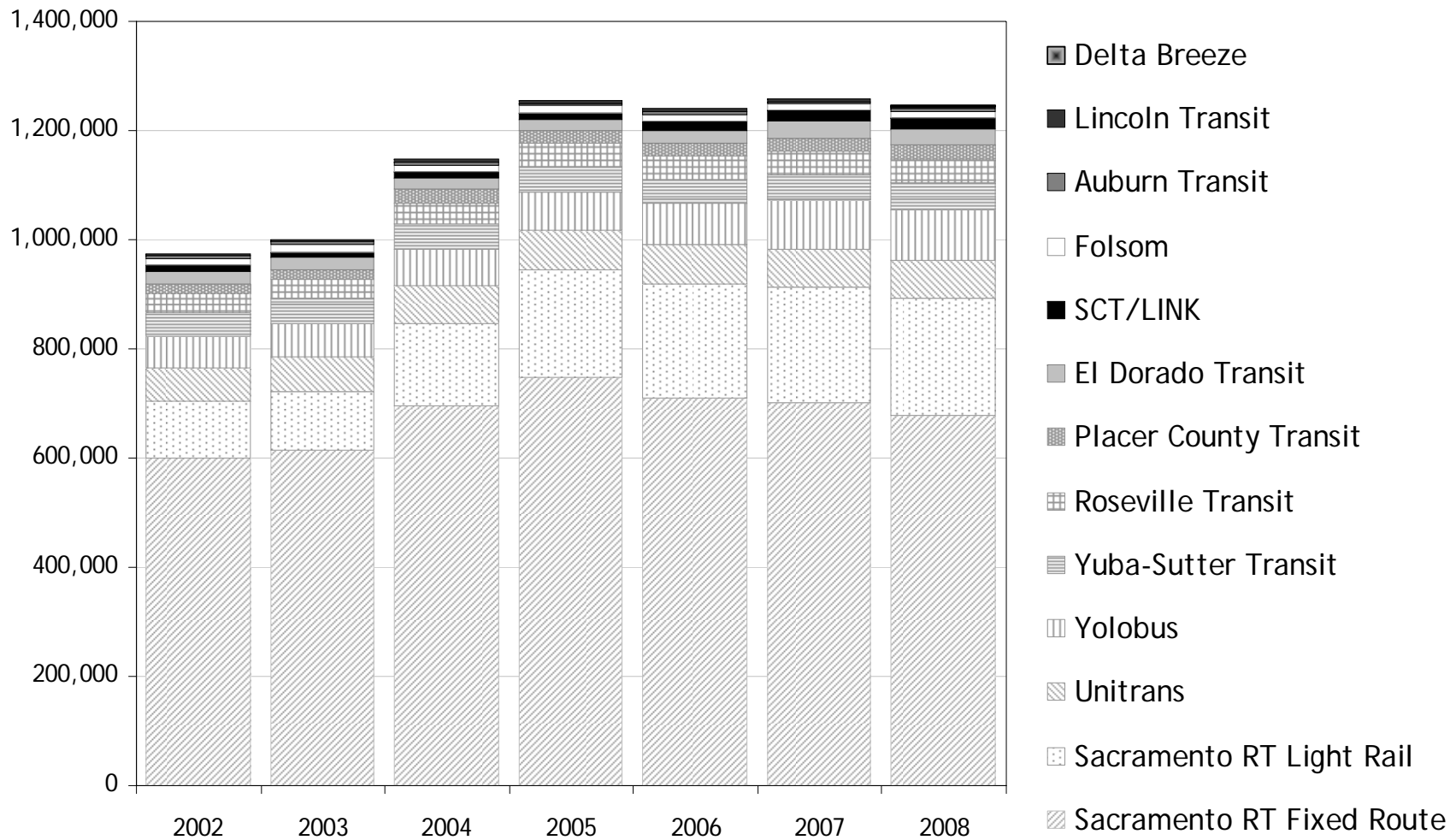
Indicator	2002	2003	2004	2005	2006	2007	2008	Annual Average % Change	
								'02 to '05	'05 to '08
<i>Vehicle Service Hours*</i>									
LRT**	103,693	105,752	149,763	197,255	208,854	209,725	215,947	+23.9%	+3.1%
Bus	<u>871,568</u>	<u>894,665</u>	<u>998,023</u>	<u>1,057,126</u>	<u>1,031,984</u>	<u>1,049,420</u>	<u>1,029,117</u>	<u>+6.6%</u>	<u>-0.9%</u>
Total	975,261	1,000,417	1,147,786	1,254,381	1,240,838	1,259,145	1,245,064	+8.8%	-0.2%
<i>Vehicle Service Miles*</i>									
LRT**	2,128,498	2,170,991	2,878,822	3,429,277	3,888,222	4,127,718	4,266,965	+17.2%	+7.6%
Bus	<u>12,655,473</u>	<u>13,109,425</u>	<u>13,853,442</u>	<u>13,639,236</u>	<u>13,216,367</u>	<u>13,604,612</u>	<u>13,533,333</u>	<u>+2.5%</u>	<u>-0.3%</u>
Total	14,783,971	15,280,416	16,732,264	17,068,513	17,104,589	17,732,330	17,800,298	+4.9%	+1.4%
<i>Passenger Boarding (Annual)</i>									
LRT	8,541,086	8,859,032	11,022,004	12,008,620	14,452,137	14,489,691	15,484,670	+12.0%	+8.8%
Bus	<u>23,666,453</u>	<u>25,787,483</u>	<u>25,786,296</u>	<u>25,282,969</u>	<u>23,144,063</u>	<u>23,950,747</u>	<u>24,300,696</u>	<u>+2.2%</u>	<u>-1.3%</u>
Total	32,207,539	34,646,515	36,808,300	37,291,589	37,596,200	38,440,438	39,785,366	+5.0%	+2.2%
<i>Per Capita Measures</i>									
6-County Population	1,992,365	2,045,646	2,096,247	2,145,421	2,183,839	2,217,518	2,248,729	+2.5%	+1.6%
Bus VSH per Capita	0.44	0.44	0.48	0.49	0.47	0.47	0.46	+4.0%	-2.4%
LRT VSH per Capita	<u>0.05</u>	<u>0.05</u>	<u>0.07</u>	<u>0.09</u>	<u>0.10</u>	<u>0.09</u>	<u>0.10</u>	<u>+20.9%</u>	<u>+1.5%</u>
Total VSH per Capita	0.49	0.49	0.55	0.58	0.57	0.57	0.55	+6.1%	-1.8%
Bus VSM per Capita	11.88	12.61	12.30	11.78	10.60	10.80	10.81	-0.3%	-2.8%
LRT VSM per Capita	<u>1.07</u>	<u>1.06</u>	<u>1.37</u>	<u>1.60</u>	<u>1.78</u>	<u>1.86</u>	<u>1.90</u>	<u>+14.4%</u>	<u>+5.9%</u>
Total VSM per Capita	7.42	7.47	7.98	7.96	7.83	8.00	7.92	+2.3%	-0.2%
Bus Pass-Bdg per Capita	11.88	12.61	12.30	11.78	10.60	10.80	10.81	-0.3%	-2.8%
LRT Pass-Bdg per Capita	<u>4.29</u>	<u>4.33</u>	<u>5.26</u>	<u>5.60</u>	<u>6.62</u>	<u>6.53</u>	<u>6.89</u>	<u>+9.3%</u>	<u>+7.2%</u>
Tot. Pass-Bdg per Capita	16.17	16.94	17.56	17.38	17.22	17.33	17.69	+2.4%	+0.6%
<i>Productivity Measures</i>									
Pass Bdg/VSH	33.0	34.6	32.1	29.7	30.3	30.5	32.0	-3.4%	+2.4%
Pass Bdg/VSM	2.18	2.27	2.20	2.18	2.20	2.17	2.24	+0.1%	+0.8%

Source: SACOG, March 2010. Based on the data from the State Controller's Office annual reports, Triennial Performance Audits, the National Transit Database, and from reports and data provided directly by transit operators. Population data from California Department of Finance.

\*Revenue service miles and hours, not total miles and hours. Totals exclude E-Tran, which was missing data for many years in the series.

\*\*LRT service hours and miles are for vehicles, not consists; e.g. a 2-vehicle consist traveling for 30 miles at 30mph generates 60 VSM and 2 VSH.

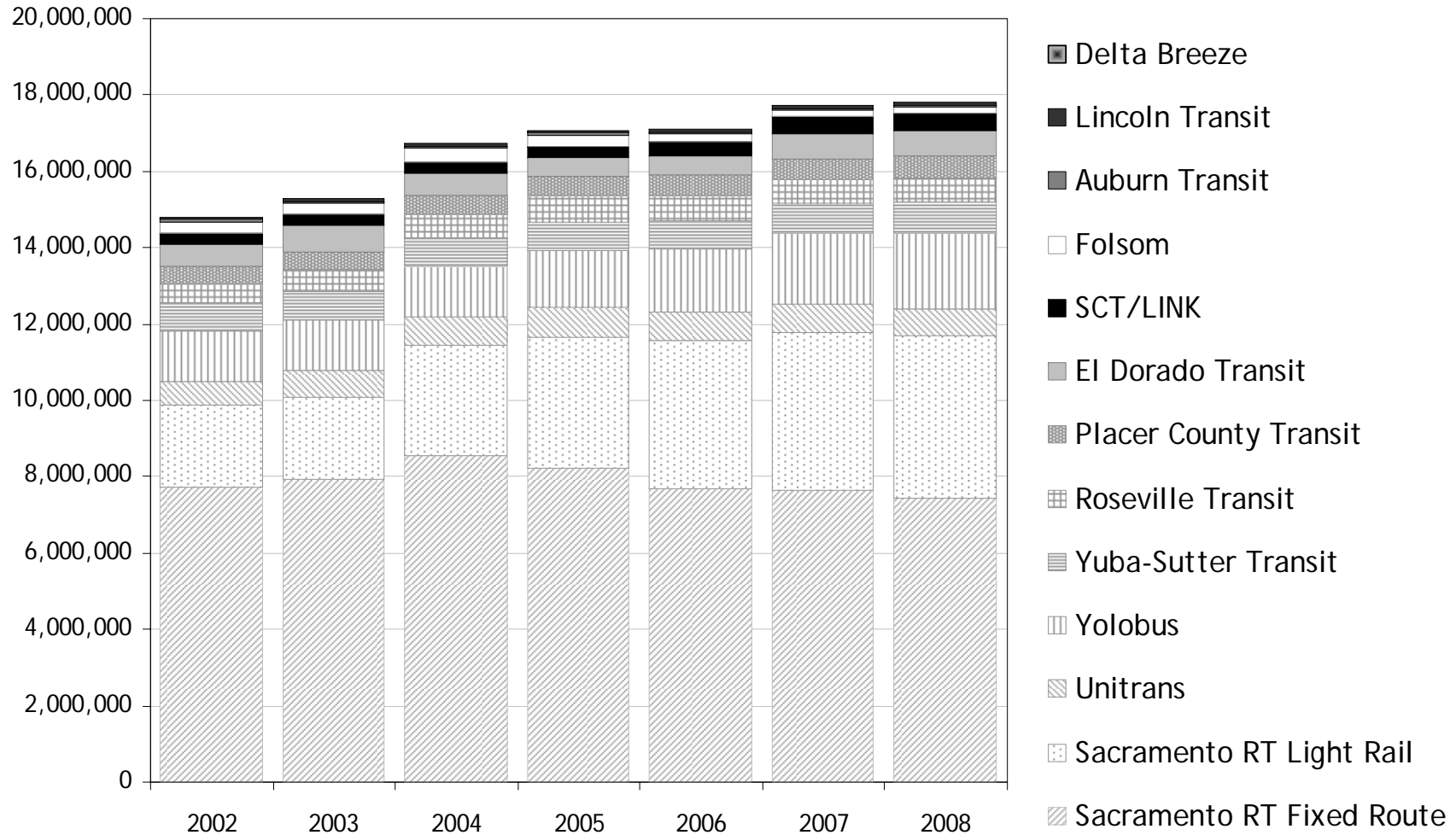
Figure 24. Annual Fixed-Route Vehicle Service Hours by Operator, 2002 to 2008



Source: SACOG, March 2010. Based on the data from the State Controller's Office annual reports, Triennial Performance Audits, the National Transit Database, and from reports and data provided directly by transit operators. Totals exclude E-Tran, which was missing data for many years in the series.

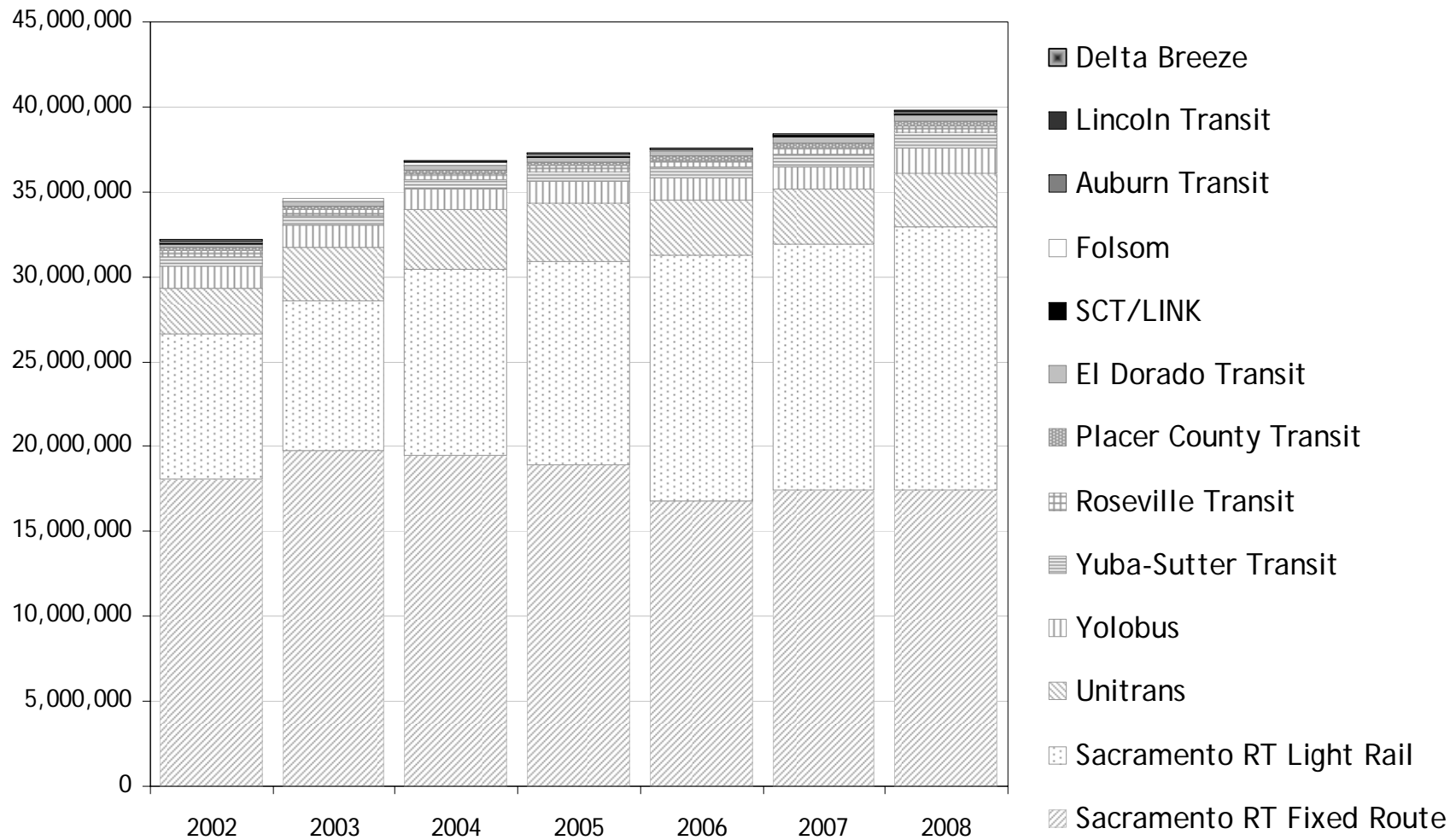
**Figure 25. Annual Fixed Route Vehicle Service Miles by Operator, 2002 to 2008**

Source: SACOG, March 2010. Based on the data from the State Controller's Office annual reports, Triennial Performance Audits, the National



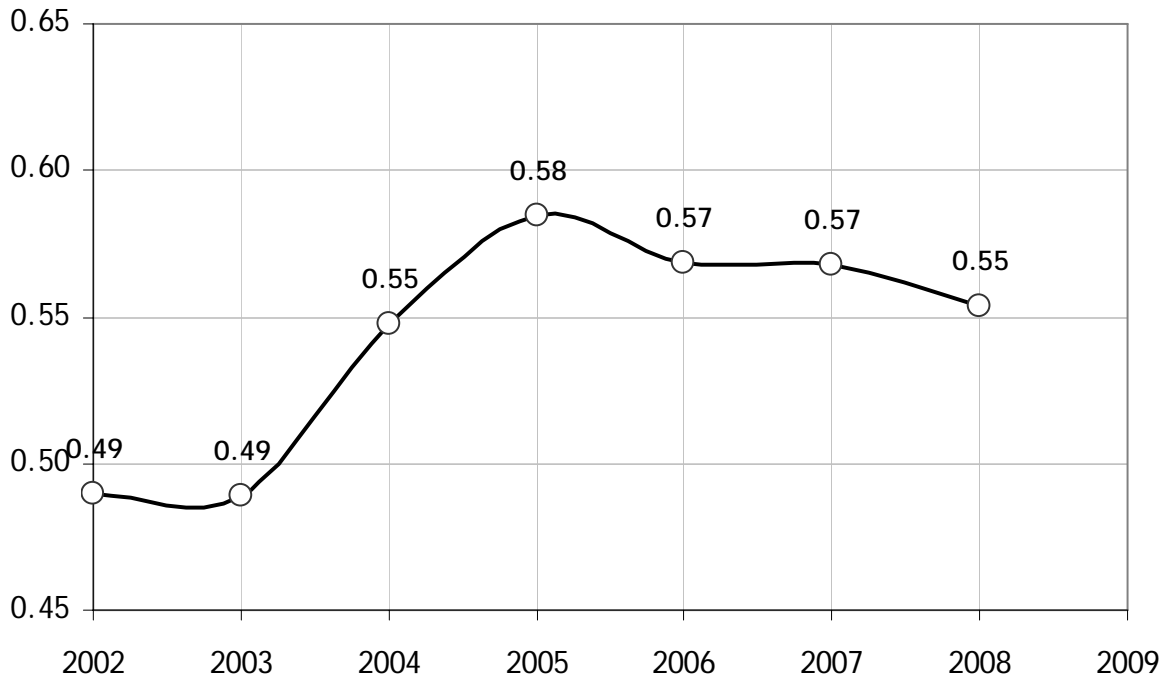
Transit Database, and from reports and data provided directly by transit operators. Totals exclude E-Tran, which was missing data for many years in the series.

Figure 26. Annual Fixed-Route Passenger Boardings by Operator, 2002 to 2008



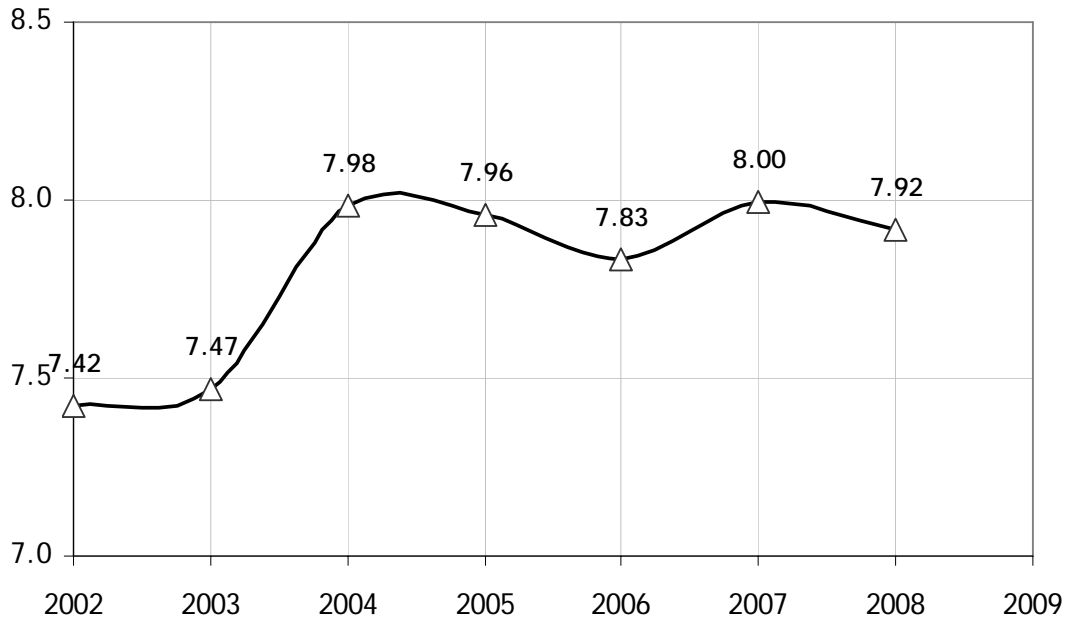
Source: SACOG, March 2010. Based on the data from the State Controller’s Office annual reports, Triennial Performance Audits, the National Transit Database, and from reports and data provided directly by transit operators. Totals exclude E-Tran, which was missing data for many years in the series.

Figure 27. Annual Fixed Route Vehicle Service Hours per Capita, 2002 to 2008

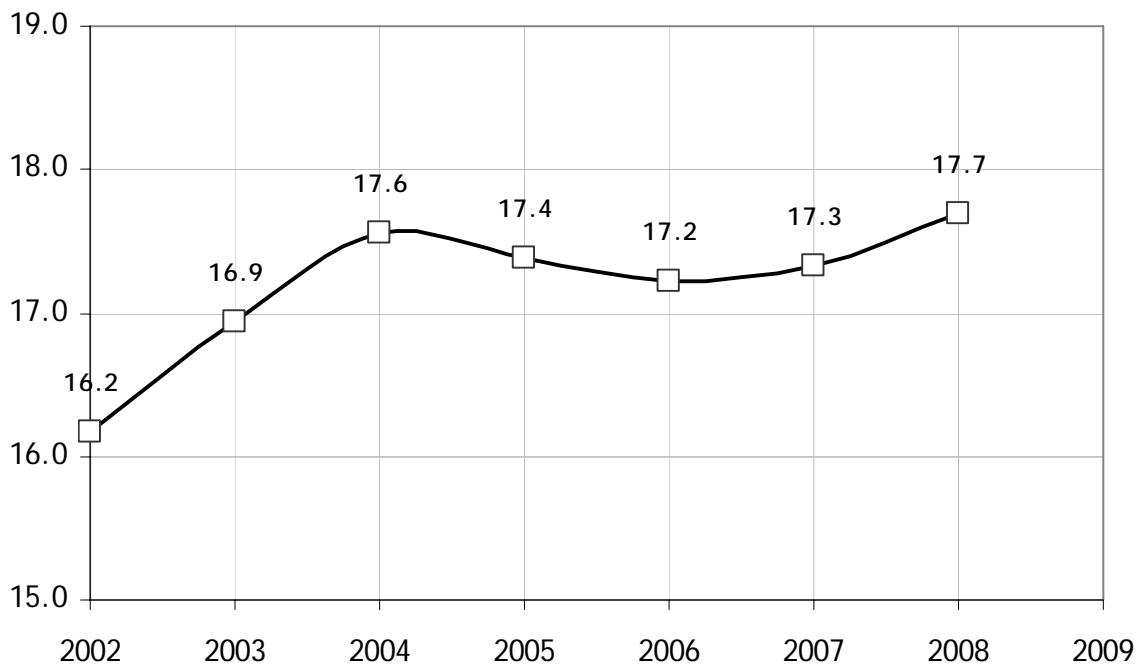


Source: SACOG, March 2010. Based on the data from the State Controller’s Office annual reports, Triennial Performance Audits, the National Transit Database, and from reports and data provided directly by transit operators. Population figures from California Department of Finance. Totals exclude E-Tran, which was missing data for many years in the series.

**Figure 28. Annual Fixed Route Vehicle Service Miles per Capita, 2002-2008, SACOG Six-County Area**

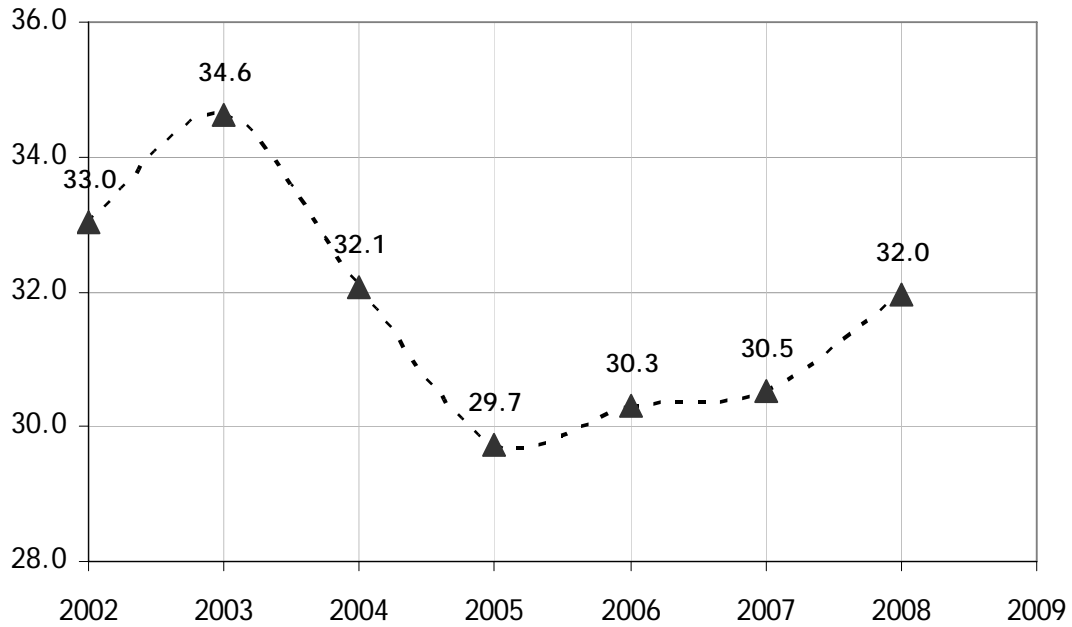


**Figure 29. Annual Fixed Route Passenger Boardings per Capita, 2002 to 2008, SACOG Six-County Area**

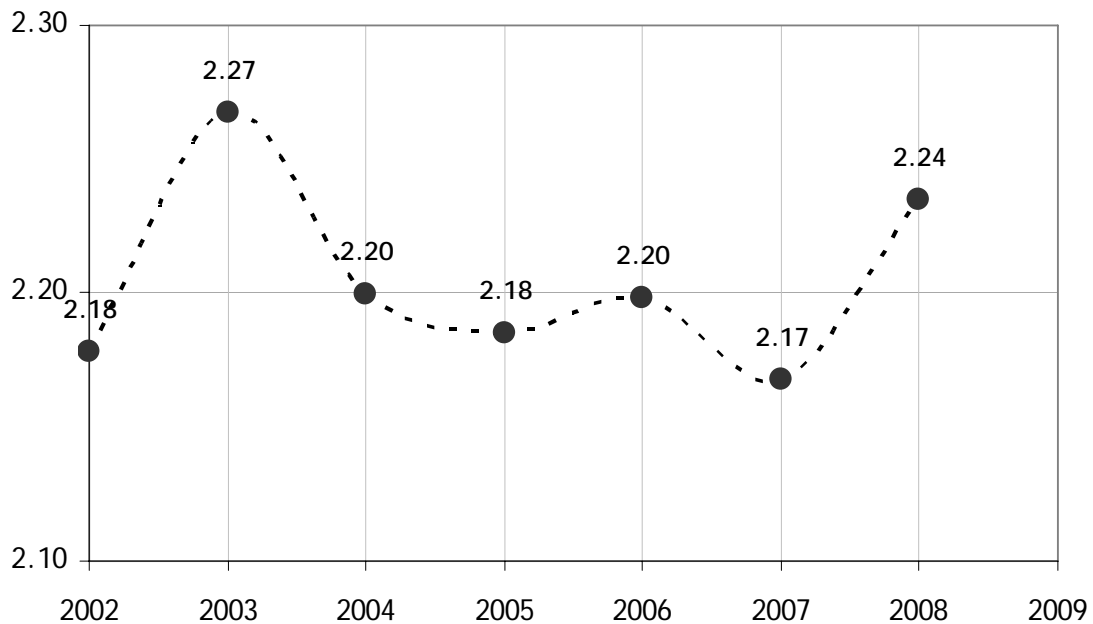


Source for both figures: SACOG, March 2010. Based on the data from the State Controller’s Office annual reports, Triennial Performance Audits, the National Transit Database, and from reports and data provided directly by transit operators. Population figures from California Department of Finance. Totals exclude E-Tran, which was missing data for many years in the series.

**Figure 30. Annual Fixed Route Passenger Boardings Per Service Hour, 2002 to 2008, Six-County Sacramento Region**



**Figure 31. Annual Fixed Route Passenger Boardings Per Service Mile, 2002 to 2008, Six-County Sacramento Region**



Source for both figures: SACOG, March 2010. Based on the data from the State Controller’s Office annual reports, Triennial Performance Audits, the National Transit Database, and from reports and data provided directly by transit operators. Totals exclude E-Tran, which was missing data for many years in the series.

## Capitol Corridor Ridership and Service

Capitol Corridor service has expanded significantly since its inception. Figure 32 shows annual passenger ridership to, from and within the Sacramento region for 2002 to 2008. Total ridership increased by over 50 percent in total, and by 36 percent on a per capita basis. The annual average growth in per capita ridership was just over 5 percent, which is more than double the growth in population.

Figure 32 shows the increase in ridership, correlated with key changes to services over the 2002 to 2008 period. Over this period, service frequency increased from 18 trains per day to 32 trains per day.

Figure 33 shows a subset of Capitol Corridor ridership of special interest for transportation planning in the Sacramento region: passengers with trip origins and destinations within the Sacramento region. This subset of passengers accounted from 11 to 15 percent of all Capitol Corridor ridership to, from, or within the region. For the years 2002 to 2006, this subset of ridership was relatively stable at about 120,000 passengers per year; since 2006, this subset of ridership increased sharply to over 200,000.

**Table 17. Annual Capitol Corridor Passengers To, From, and Within the Sacramento Region\***

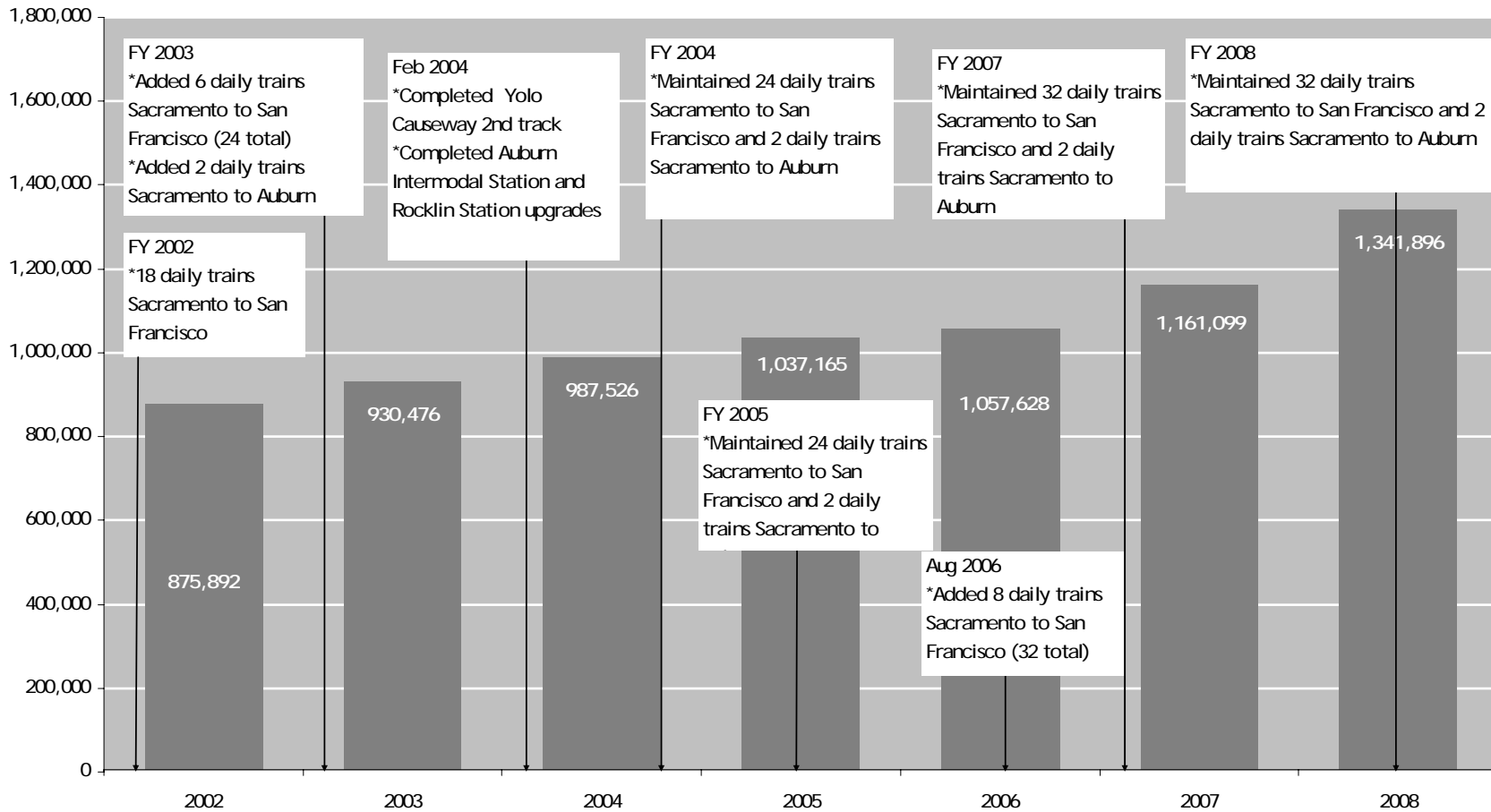
Year	Annual Riders	Ann. Riders Per Capita
2002	875,892	0.44
2003	930,476	0.46
2004	987,526	0.47
2005	1,037,165	0.49
2006	1,057,628	0.49
2007	1,161,099	0.53
2008	1,341,896	0.60
'02 to '08 Change	+53.2%	+36.0%
AAGR	+7.4%	+5.3%

Source: SACOG, March 2010.

Based on data provided by the Capitol Corridor Joint Powers Authority.

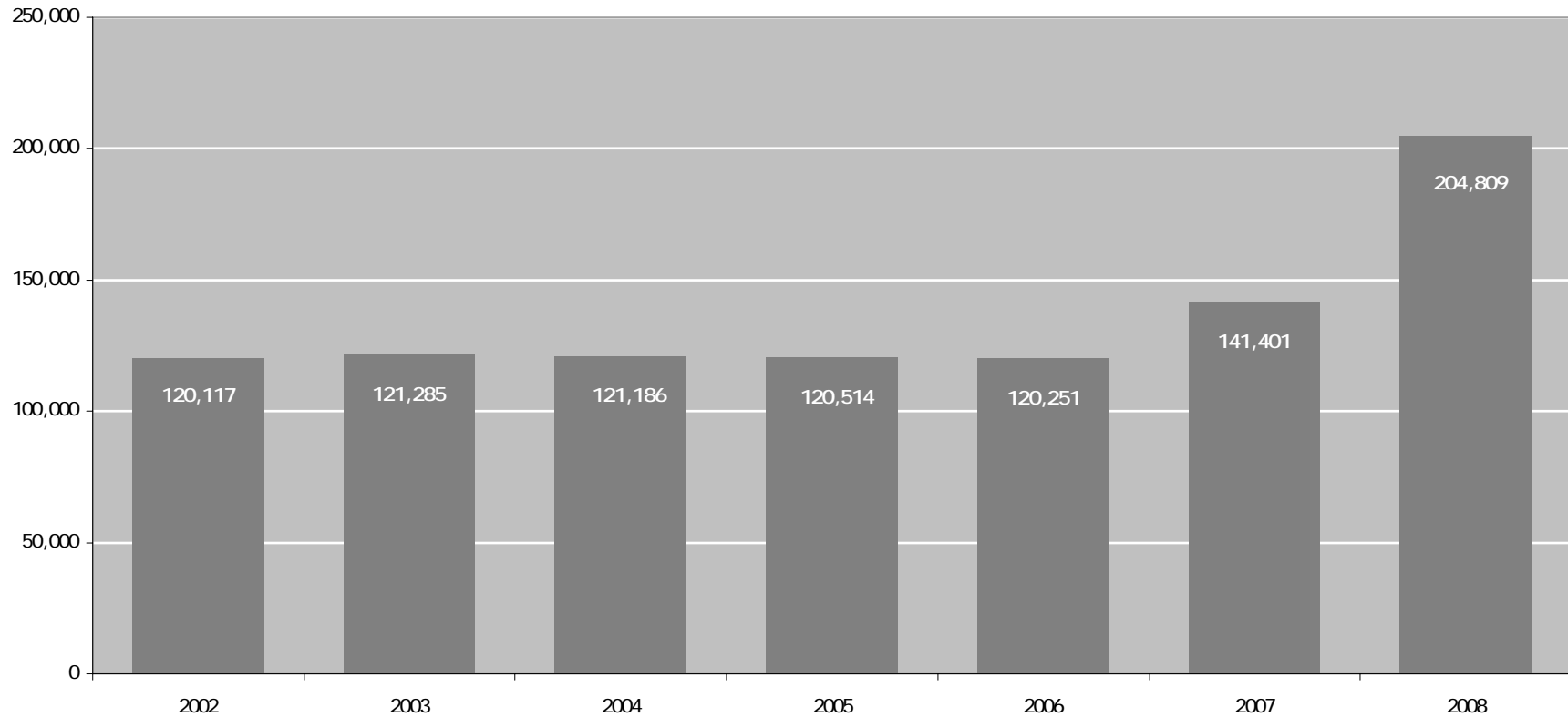
\* Stations in the Sacramento region include Davis, Sacramento, Roseville, Rocklin, and Auburn.

Figure 32. Annual Capitol Corridor Passengers To, From, and Within the Sacramento Region\*



Source: SACOG, March 2010. Based on ridership statistics from the Capitol Corridor Joint Powers Authority.  
\* Stations in the Sacramento region include Davis, Sacramento, Roseville, Rocklin, and Auburn.

Figure 33. Annual Capitol Corridor Passengers with Origin and Destination in the Sacramento Region\*



Source: SACOG, March 2010. Based on ridership statistics from the Capitol Corridor Joint Powers Authority.

\* Stations in the Sacramento region include Davis, Sacramento, Roseville, Rocklin, and Auburn.

## APPENDIX A: Comparison of Census and American Community Survey Data

This report compares across two U.S. Census Bureau datasets: The Year 2000 Decennial Census, and the American Community Survey.

The Decennial Census collects data every 10 years about households, income, education, homeownership, and more for the United States, Puerto Rico, and the Island areas. The data is used for apportionment of the seats in the House of Representatives. Most of the data used here comes from the "Summary File 3" datasets. Summary File 3 (SF 3) contains some of the richest and most complete statistical data available on U.S. residents - it is the most popular Census 2000 data product. Based on questions from the long form questionnaire, these data were collected from 1 in 6 households in the U.S. as part of Census 2000. SF 3 contains data on such topics as income, ancestry, citizenship status, home values, commute time to work, occupation, education, veteran status, language ability, migration, place of birth, and many others. No other U.S. survey - public or private - collects data from this many people.

The American Community Survey is a new nationwide survey designed to provide communities a fresh look at how they are changing. It is a critical element in the Census Bureau's reengineered 2010 census plan. The ACS collects and produces population and housing information every year instead of every ten years. Collecting data every year provides more up-to-date information throughout the decade about the U.S. population at the local community level. About three million housing unit addresses are selected annually, from across every county in the nation. The ACS publishes two sorts of data currently:

- *Single-Year Estimates.* Beginning with the 2005 ACS, and continuing every year thereafter, 1-year estimates are available annually for geographic areas with a population of 65,000 or more. This includes the nation, all states and the District of Columbia, all congressional districts, approximately 800 counties, and 500 metropolitan and micropolitan statistical areas, among others.
- *Multiyear Estimates.* In 2008, the Census Bureau released its first 3-year estimates based on ACS data collected from 2005 through 2007. These 3-year estimates are available annually for geographic areas with a population of 20,000 or more, including the nation, all states and the District of Columbia, all congressional districts, approximately 1,800 counties, and 900 metropolitan and micropolitan statistical areas, among others. For areas with a population less than 20,000, 5-year estimates will be available. The first 5-year estimates, based on ACS data collected from 2005 through 2009, will be released in 2010.

ACS data used for this report comes entirely from the first two releases of 3-year estimates for the six counties in the SACOG region.

Because of differences in the samples, the survey methodology, and some of the specific definitions used in the ACS versus the Decennial Census, comparisons across the datasets should be made with caution. In general, SACOG staff utilized guidance in doing so published by the U.S. Census Bureau (<http://www.census.gov/acs/www/UseData/compACS2008.htm>)

In some cases, implied changes found in comparing across the datasets are shaded in tables, with notes related to the comparison provided.

For both Decennial Census and ACS, estimates were aggregated from six county-level estimates provided in the datasets. Decennial Census data are published without margins-of-error, so aggregation of the estimates was simple. The ACS data is published with margins-of-error, and the MOE estimates were aggregated along with the variables. The process of aggregating MOE's was: 1) converting MOE to standard error (divide by 1.65); 2) aggregating squared error across the counties or categories involved; 3) converting back to standard error for the aggregated data (taking square root of the result of step 2); and converting to 90<sup>th</sup> percentile MOE (multiply result of step 3 by 1.65).

For Table 6 (Commute Mode) some difference-of-estimate tests were performed. Since MOE's were not reported in the 2000 Decennial Census, the MOE for the 2005-2007 ACS data were used as a "best guess" of the MOE for the 2000 Decennial Census estimates—this approach was conservative, since the sample rate for the SF3 data from the 2000 Decennial Census was 1-in-6, while the ACS sampling rates are much lower.

## Appendix B: Notes on Transit Data Sources

Transit data were taken from the following sources in the following order:

1. Triennial Performance Audits
2. State Controller's Reports
3. National Transit Database Reports
4. Estimates based on known data

**“Transit data” or “data” refers to the three measures used in this report: vehicle service hours (VSH), vehicle service miles (VSM), and unlinked passenger trips (UPT). Data were collected from different sources for different fiscal years and operators, but in only one case (Roseville Transit FY 2006) were VSH, VSM, and UPT collected from different sources in the same fiscal year. Pages 2-3 of this appendix outline, for each operator, which sources were used for which fiscal year.**

### Triennial Performance Audits

The California Public Utilities Code (PUC) requires that all transit operators and Regional Transportation Planning Agencies that receive funding from Article 4 of the Transportation Development Act (TDA) have a triennial performance audit (TPA) conducted of their activities. In addition to meeting a legal requirement, a performance audit also provides an opportunity for an independent, objective, and comprehensive review of the economy, efficiency, and effectiveness of the entity being audited. TPA data were used to the greatest extent possible for FY 2001 – FY 2006. As the next round of performance audits are currently underway (for FY 2007 – FY 2009), other data sources were used to fill in data gaps in this report. See the “State Controller's Reports” and “National Transit Database” headings for information on other data sources.

### State Controller's Reports

Cities, counties, transit districts, and CTSAs that receive TDA transit allocations are required by PUC Section 99243 to file a report of revenues and expenses following the close of each fiscal year. In addition to financial information, these reports detail service level characteristics like service miles, service hours, and unlinked passenger trips. For the most part, when performance audit data were unavailable, State Controller's Report (SCR) data were used instead. In some instances, neither performance audit nor SCR data were available for a given operator/year and another data source was used to fill in data gaps. See the “Triennial Performance Audits” and “National Transit Database” headings for information on other data sources.

### National Transit Database

Recipients or beneficiaries of grants from the Federal Transit Administration (FTA) under the Urbanized Area Formula Program (5307) or Other than Urbanized Area (Rural) Formula Program (5311) are required by statute to submit data to the National Transit Database (NTD). The database includes operational and service characteristics, capital revenues and assets, and financial statistics for operations. In the event that neither TPA nor SCR data were available, NTD data were used instead. See the “Triennial Performance Audits” and “State Controller's Reports” headings for information on other data sources.

### Estimates Based on Known Data

In rare cases, data from the above-listed three sources were unavailable. In most cases, data were unavailable because the data were aggregated for an operator's entire system and did not distinguish among demand response, vanpool, fixed route, and other special services. In some cases the data were simply missing or inconsistent with previous years' data. Estimates were therefore calculated for one year of El Dorado Transit data and four years of Placer County Transit data. For a detailed review of how these estimates were calculated see the "El Dorado County Transit" and "Placer County Transit" headings below.

See also:

<http://www.dot.ca.gov/hq/MassTrans/State-TDA.html>

[http://www.sco.ca.gov/ard\\_locrep\\_transit.html](http://www.sco.ca.gov/ard_locrep_transit.html)

<http://204.68.195.57/ntdprogram/index.htm>

Data Sources by Operator and Year							
Operator	2002	2003	2004	2005	2006	2007	2008
Auburn Transit	TPA	TPA	TPA	TPA	TPA	SCR	SCR
Delta Breeze	See Notes	See Notes	See Notes	See Notes	See Notes	See Notes	See Notes
El Dorado Transit	See Notes	TPA	TPA	TPA	TPA	SCR	SCR
e-Tran							
Folsom Stage Line	TPA	TPA	TPA	TPA	TPA	SCR	SCR
Lincoln Transit	TPA	SCR	SCR	SCR	SCR	SCR	SCR
Placer County Transit	See Notes	See Notes	TPA	TPA	TPA	See Notes	See Notes
Roseville Transit	NTD	SCR	TPA	TPA	TPA/NTD	NTD	SCR
Sacramento RT Fixed Route	TPA	TPA	TPA	TPA	TPA	SCR	SCR
Sacramento RT Light Rail	TPA	TPA	TPA	TPA	TPA	SCR	SCR
SCT/LINK	TPA	TPA	TPA	TPA	TPA	SCR	SCR
Unitrans	TPA	TPA	TPA	TPA	TPA	SCR	SCR
Yolobus	TPA	TPA	TPA	TPA	TPA	SCR	SCR
Yuba-Sutter Transit	TPA	TPA	TPA	TPA	TPA	SCR	SCR

#### Auburn Transit

Data for FY 2002 - FY 2006 were taken from TPAs. Data for FY 2007 - FY 2008 were taken from SCRs.

#### Delta Breeze

Rio Vista Delta Breeze offers deviated fixed route bus service within the City of Rio Vista and between Isleton, Rio Vista, Fairfield, Suisun City, Pittsburg/Bay Point BART Station and Antioch with connections to Lodi. The transit data provided for this report include only the portion of service serving the City of Isleton. Transit data for FY 2002 – FY 2008 were taken from reports provided by the operator.

**El Dorado County Transit**

Data for FY 2003 – FY 2006 were taken from TPAs. Data for FY 2007 and FY 2008 were taken from SCRs. Prior to FY 2003, performance audit data were aggregated instead of split out by mode. So, for FY 2002, estimates were derived by looking at mode share for available years (FY 2003 – FY 2006) and applying that mode share to the aggregate FY 2002 data.

**e-Tran**

e-Tran was not included in regional totals because only two and a half years of data were available.

**Folsom Stage Lines**

Data for FY 2002 - FY 2006 were taken from TPAs. Data for FY 2007 - FY 2008 were taken from SCRs.

**Lincoln Transit**

FY 2002 data were taken from Lincoln Transit's TPA. FY 2003 – FY 2008 data were taken from SCRs.

**Placer County Transit**

Tahoe Area Regional Transit (TART) data were excluded from this report because TART's service area is outside the SACOG planning region. Placer County Transit data for FY 2004 – FY 2006 were taken from TPAs. Prior to FY 2004, TPA data were aggregated instead of split out by mode. So, for FY 2002 and FY 2003, estimates were derived by looking at mode share for available years (FY 2004– FY 2006) and applying that mode share to the aggregate FY 2002 and FY 2003 data. In FY 2007, TPA and SCR data were unavailable, so NTD data were used to estimate VSH, VSM, and unlinked passenger trips (UPT). Because the NTD includes TART service in its totals, a multiplication factor was applied to NTD data to produce FY 2007 estimates for Placer County Transit's share of service. In FY 2008, TPA and NTD data were unavailable, so SCR data were used to estimate VSH, VSM, and UPT. Because SCRs include TART service in the totals, a multiplication factor was applied to SCR data to produce FY 2008 estimates for Placer County Transit's share of service.

**Roseville Transit**

Data for FY 2002 and FY 2007 were taken from NTD reports. Data for FY 2003 and FY 2008 were taken from SCRs. Data for FY 2004 and 2005 were taken from TPAs. In FY 2006, VSM data were taken from NTD reports and VSH and UPT were taken from the Roseville Transit TPA.

**Sacramento Regional Transit**

Data for FY 2002 - FY 2006 were taken from TPAs. Data for FY 2007 - FY 2008 were taken from SCRs.

**South County Transit**

Data for FY 2002 - FY 2006 were taken from TPAs. Data for FY 2007 - FY 2008 were taken from SCRs.

**Unitrans**

Data for FY 2002 - FY 2006 were taken from TPAs. Data for FY 2007 - FY 2008 were taken from SCRs.

**Yolobus**

Data for FY 2002 - FY 2006 were taken from TPAs. Data for FY 2007 - FY 2008 were taken from SCRs.

**Yuba-Sutter Transit**

Data for FY 2002 - FY 2006 were taken from TPAs. Data for FY 2007 - FY 2008 were taken from SCRs.