

California's Roads and Highways: Conditions and Travel Trends

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**Transportation California is a coalition of contractors, unions and other
Organizations concerned about the future of California's highways.**

Founded in 1971, The Road Information Program (TRIP) ® of Washington, DC is a nonprofit organization that researches, evaluates and distributes economic and technical data on highway transportation issues. TRIP is sponsored by insurance companies, equipment manufacturers, distributors and suppliers; businesses involved in highway engineering, construction and finance; labor unions; and organizations concerned with an efficient and safe highway transportation network.

EXECUTIVE SUMMARY

California has an extensive network of approximately 30,000 miles of major roads that provide access and mobility throughout the state. This system carries the bulk of the approximately 300 billion miles of vehicle travel annually. The condition of the system is deteriorating and California drivers are paying a high price to drive on the state's roads.

California ranks third in the country in percentage of major roads in need of repair or improvement.

- Nearly half of the state's roads are in poor or mediocre condition. 18 percent are rated in poor condition. Roads in poor condition often have significant potholes, cracking or rutting and need resurfacing or reconstruction to return to good condition.
- 29 percent of the state's roads are rated in mediocre condition and may show defects such as rutting and extensive patching.
- The Federal Highway Administration rates 49 percent of California's urban interstates and freeways as congested, because they carry more traffic than they were designed to handle.

California ranks fourth nationally in extra vehicle operating costs incurred from driving on roads in need of repair.

- California motorists pay an average of \$354 each in extra vehicle operating costs annually as a result of driving on roads in poor, mediocre and fair condition.
- California motorists pay a total of \$7.4 billion annually in extra vehicle operating costs.
- Extra vehicle operating costs have been calculated in the Highway Development and Management Model (HDM), which is recognized by the U.S. Department of Transportation and more than 100 other countries as the definitive analysis of the impact of road conditions on vehicle operating costs. The HDM report is based on numerous studies that have measured the impact of various factors, including road conditions, on vehicle operating costs.

Travel in California continues to increase in response to population growth and economic expansion.

- Vehicle miles of travel on California's roads increased 93 percent between 1980 and 2000 to 300 billion miles. Vehicle miles of travel in California are projected to increase another 70 percent by the year 2025.
- California's population increased by 33 percent between 1980 and 2000, from 24 million residents to 32 million. By the year 2025, California's population is expected to increase by another 53 percent to 49 million people.
- California's gross state product, adjusted for inflation, doubled between 1980 and 2000, from \$685 billion to \$1.3 trillion.
- 67 percent of the \$639 billion worth of freight shipped from sites in California annually is transported by truck and another 17 percent is shipped by courier services, which also rely on highways.
- 86 percent of all trips longer than 100 miles beginning and ending in California are taken in private motor vehicles; 12% are taken by airplane and 2% are by bus or rail.

Introduction

This report looks at the condition and use of California's roads and bridges and demographic and economic trends affecting the use of the state's transportation system.

The backbone of the state's transportation network is its approximately 30,000 miles of major roads, which accommodates California's 32 million residents. The state's major roads are heavily congested, which causes delays and harms economic productivity. Congestion results in significant wear and tear on the state's roads and increases the need for timely pavement repairs and expansions of key routes.

The ability of California's residents to maintain and enhance their level of future mobility is dependent on whether the state will be able to invest adequately in modernizing its aging highway transportation system. In accommodating the travel demands of the millions of additional people expected to live in California by the year 2025, the state is focusing on strategic improvements to conditions, limited system expansion and increasing the efficiency of the overall system. These projects include the repair and replacement of aging roads and bridges and improvements of intersections and key arterial routes to increase traffic flow.

Sources of information for this study include the Federal Highway Administration, U.S. Census Bureau and the U.S. Department of Commerce.

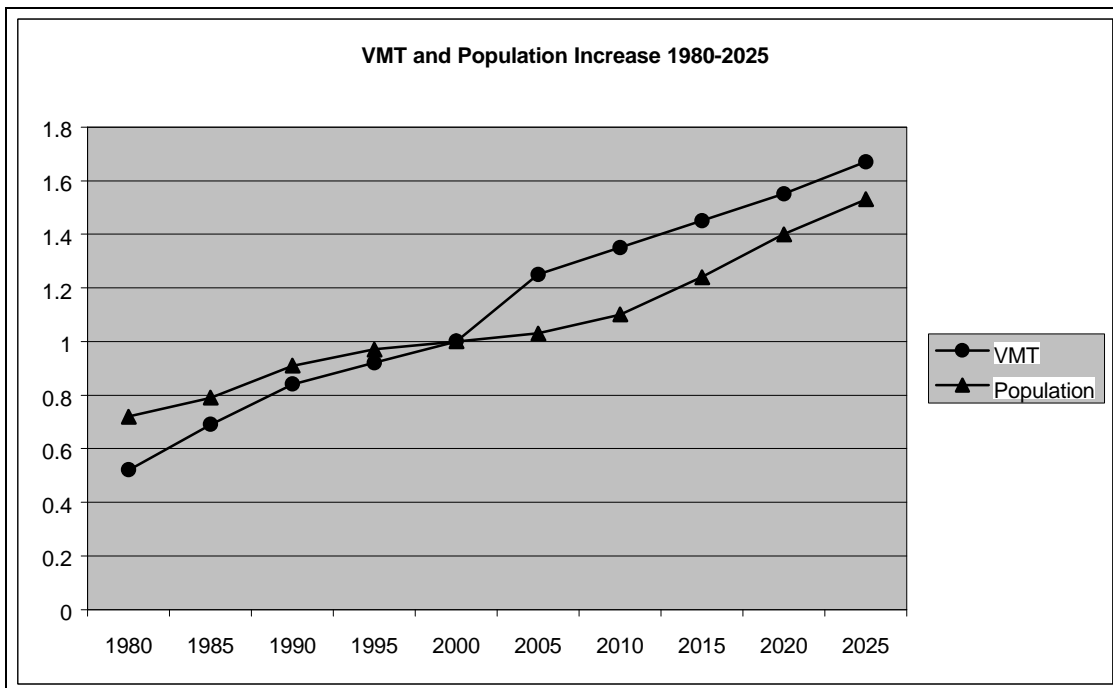
Population and Travel Growth in California

Travel continues to increase in California as the state's population and economy grows and modern lifestyles require increased personal and commercial mobility. Vehicle miles of travel (VMT) in California jumped 93 percent between 1980 and 2000, nearly doubling from 155 billion miles to 300 billion miles, according to a TRIP analysis of federal data. The U.S. Census

Bureau reported that California's population increased by 37 percent over the same period of time, from 24 million to 32 million residents. By comparison, the U.S. population increased 18 percent between 1980 and 2000, from 226 million people to 275 million people.

California's population is expected to increase by about 53 percent over the next quarter century -- a change equivalent to adding the population of another Los Angeles metropolitan area. The state's population will reach approximately 49 million people in 2025. Based on historical and projected population increases, as well as lifestyle trends, TRIP estimates that vehicle travel in California will increase by 70 percent over the next 25 years, to more than 500 billion miles annually by 2025.

**Chart 1. Population and Vehicle Travel Growth 1980 to 2000 and Projected to 2025
(1 = 100 percent of 2000 total)**



Source: The Road Information Program analysis of U.S. Census Bureau and Federal Highway Administration data

Chart 2. Population and Vehicle Miles of Travel (VMT), 1980, 2000 and 2025

Year	Population	VMT
1980	24 million	155 billion
2000	32 million	300 billion
2025	49 million	500 billion

Source: The Road Information Program analysis of U.S. Census Bureau and Federal Highway Administration data

National Personal Transportation Survey

The continued increase in highway travel in California is consistent with the findings of the Nationwide Personal Transportation Study (NPTS), which found that average daily trips-per-person increased 10 percent nationally between 1990 and 1995. The NPTS found that people are living further from their jobs, and that their work commutes often include several other stops, such as day care, schools, and shopping or social engagements. The report also found that older Americans are increasingly mobile and that current lifestyles can be expected to fuel growing future demand for additional highway mobility.

The increase in driving reflects the tremendous reliance of California residents on highways, not only for local neighborhood trips, but also for longer trips. Data from the 1995 American Travel Survey (ATS) conducted by the U.S. Department of Transportation (DOT) indicates that California residents depend significantly on the state's road system for their long-distance trips. The ATS found that of trips longer than 100 miles, one-way, beginning and ending in California, 86 percent were in private highway vehicles, 12 percent were by air and 2 percent were by bus or rail.

Traffic Congestion in California

California's major roads are heavily congested, resulting in significant wear and tear on the state's roads and increasing the need for timely pavement repairs and expanding capacity of key routes. The Federal Highway Administration rates 49 percent -- approximately half -- of California's urban highways as congested, because they carry more traffic than they were designed to handle.

Economic Importance of Roads

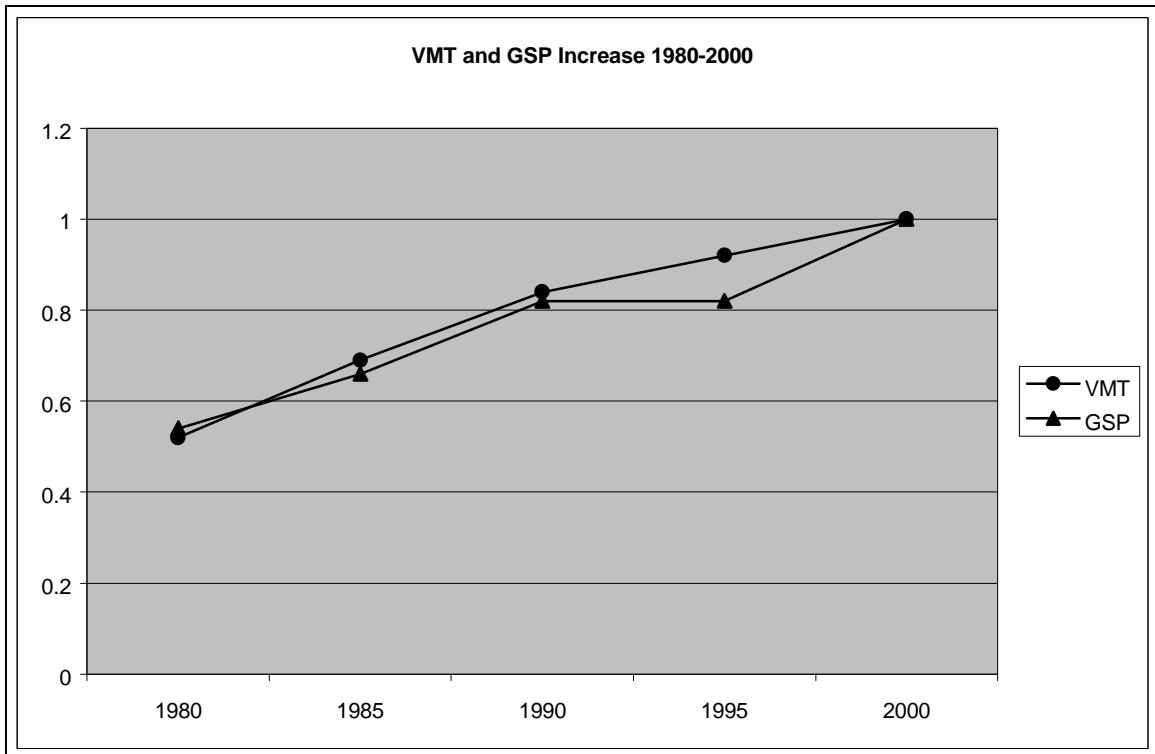
A 1997 analysis of commodity transport by the U.S. Bureau of Transportation Statistics (BTS) pointed out the economic importance of the state's road system. The BTS report found that in California, trucks transported 67 percent of the \$639 billion in products shipped annually from sites in the state. Another 17 percent were transported by courier services, which also rely on highways.

Highway travel and California's gross state product (GSP) have grown at a similar rate over the past two decades. Between 1980 and 2000, both vehicle miles of travel (VMT) and GSP, when adjusted for inflation, doubled. Between 1980 and 2000, California's GSP, adjusted for inflation, increased from \$685 billion to \$1.3 trillion; over the same period, VMT grew from 155 billion to 300 billion. Except for a period in the early 1990s, VMT and GSP grew at about the same rate.

These numbers underscore the correlation between economic development and increased mobility. For example, as the economy expands, creating more jobs and increasing consumer

confidence, the demand for consumer and business products grows. In turn, manufacturers ship greater quantities of goods to market to meet this demand, a process that adds to truck traffic on the nation's highways and major arterial roads.

**Chart 3. Gross State Product (in inflation-adjusted dollars) and Vehicle Travel Growth 1980-2000
(1 = 100 percent of 2000 total)**



Source: The Road Information Program analysis of U.S. Department of Commerce and Federal Highway Administration data

Chart 4. Gross State Product (GSP) and Vehicle Miles of Travel (VMT), 1980, 1990 and 2000

Year	Gross State Product (inflation-adjusted)	VMT
1980	\$685 billion	155 billion
1990	\$1.1 trillion	251 billion
2000	\$1.3 trillion	300 billion

Source: The Road Information Program analysis of U.S. Department of Commerce and Federal Highway Administration data

Condition of California's Roads

The Federal Highway Administration (FHWA) evaluates and classifies roads as being in poor, mediocre, fair or good condition.

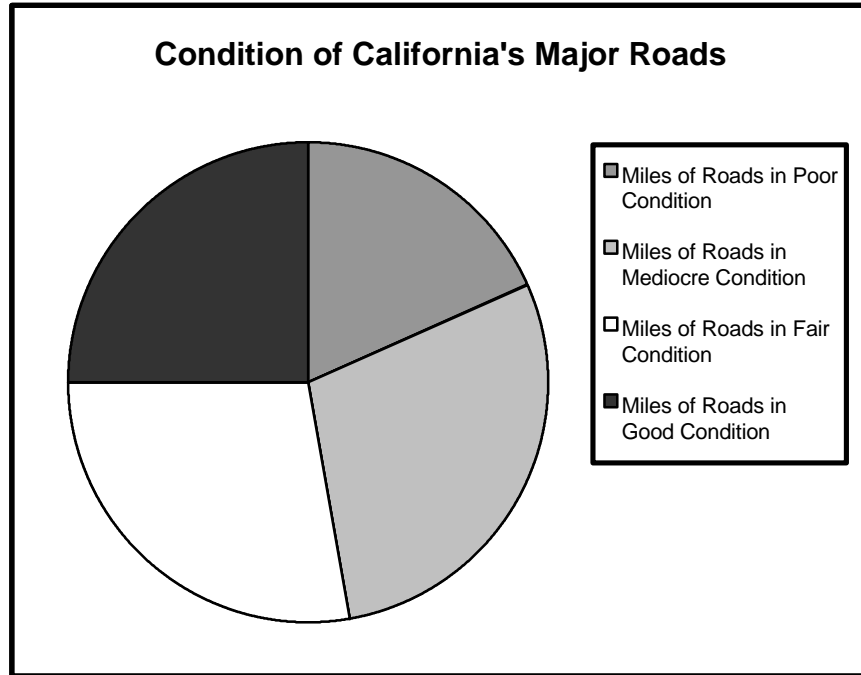
- Roads rated poor are badly cracked or broken. In some cases, poor roads can be resurfaced, but often are too deteriorated and must be reconstructed.
- Roads rated in mediocre condition may show defects such as rutting and extensive patching and have riding qualities that are noticeably inferior to those of new pavements and may need more than resurfacing to return them to good condition.

The FHWA has rated nearly one-half of California's major roads as substandard, with pavement surfaces needing resurfacing or more significant repairs to return them to good condition. Approximately two out of every 10 miles of these roads –18 percent – are rated in poor condition and another 29 percent are rated in mediocre condition.

California ranks third in the nation in percentage of major roads in poor and mediocre condition, at 47 percent. The national average is 28 percent.

The lifecycle of California's roads is greatly affected by the state's ability to perform timely maintenance. Repairing roads before they need major repairs is critical since reconstructing a road costs approximately six times more than resurfacing a road.

Chart 5. Pavement Condition of California's State-Maintained Roads



Source: The Road Information Program analysis of Federal Highway Administration data

Chart 6. Pavement Conditions by the Numbers

Road Conditions	Miles
Poor	5,588
Mediocre	8,782
Fair	8,430
Good	7,631
Total	30,431

Source: The Road Information Program analysis of Federal Highway Administration data

Chart 7. Top five states with the highest percentage of roads in poor and mediocre condition

All Arterial Roads	Percentage of roads in poor and mediocre condition
Louisiana	52%
Missouri	48%
California	47%
South Dakota	46%
New Mexico	45%
U.S. Average	28%

Source: The Road Information Program analysis of Federal Highway Administration data

Vehicle Operating Costs

When road surfaces deteriorate they tax motorists in the form of additional operating costs, which are incurred by driving vehicles on roads that are in poor, mediocre and fair condition.

Additional vehicle operating costs have been calculated in the Highway Development and Management Model (HDM), which is recognized by the U.S. Department of Transportation and more than 100 other countries as the definitive analysis of the impact of road conditions on vehicle operating costs. The HDM report is based on numerous studies that have measured the impact of various factors, including road conditions, on vehicle operating costs.

The HDM study found that road deterioration increases ownership, repair, fuel and tire costs. The report found that deteriorated roads accelerate the pace of depreciation of vehicles and the need for repairs because the stress on the vehicle increases in proportion to the level of roughness of the pavement surface. Similarly, tire wear and fuel consumption increases as roads deteriorate because it results in less efficient transfer of power to the drive train and additional friction between the road and the tires.

TRIP's additional vehicle operating cost estimate is based on taking the average number of miles driven annually by a region's driver, calculating current vehicle operating costs based on the Automobile Association of America's 2000 vehicle operating costs and then using the HDM model to estimate the additional vehicle operating costs being paid by drivers as a result of substandard roads. Additional research on the impact of road conditions on fuel consumption by the Texas Transportation Institute is also factored into the TRIP vehicle operating cost methodology.

TRIP estimates that driving on roads in need of repair costs California's motorists \$7.4 billion a year in extra vehicle operating costs -- \$354 per driver. The state ranks fourth in the country in extra vehicle operating costs per motorist. The average motorist in California drives 14,000 miles annually. A driver's individual additional vehicle operating costs may vary depending on their level of driving.

Chart 8. Top five states with the highest vehicle operating costs (VOC) per motorist

State	Vehicle Operating Costs (VOC)
New Mexico	\$432
Mississippi	\$388
Louisiana	\$387
California	\$354
Oklahoma	\$351

Source: The Road Information Program analysis of the Highway Development and Management Model and Automobile Association of America (AAA) data

Conclusion

California's 20 million licensed drivers rely on roads for their personal and commuting travel. A safe and efficient transportation system is crucial to the economic development of California, as well as providing its citizens with a high degree of personal mobility. California businesses depend on good roads to ship their products to markets in and out of state. Highway travel and gross state product in California increased at a similar rate between 1980 and 2000.

Road conditions can have a major impact in highway safety. Yet nearly one-half of the state's roads are in need of repair or improvement, placing California third in the nation in percentage of roads in poor and mediocre condition. In addition, nearly one-third of California's bridges are structurally deficient or functionally obsolete.

The worsening condition of the roads also taxes motorists statewide. California drivers pay \$7.4 billion in extra vehicle costs due to driving on roads in need of repair or improvement -- \$354 per motorist. California ranks fourth in the nation in extra vehicle operating costs per motorist. Extra vehicle costs are incurred by driving on roads in poor, mediocre and fair condition. In addition, California's major roads are heavily congested, resulting in significant wear and tear on the state's roads and increasing the need for timely pavement repairs and expanding capacity of key routes.

The cost of improving roads and bridges statewide will only increase in the future, especially with vehicle travel and population expected to continue to increase over the next 25 years, adding more and more vehicles on the roads.