

# ***FUTURE MOBILITY IN CALIFORNIA***

The Condition, Use and Funding of California's Roads,  
Bridges and Transit System

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Prepared by:

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*Founded in 1971, 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 and transit engineering and construction; labor unions; and organizations concerned with an efficient and safe highway transportation network.*

## **Executive Summary**

California's extensive system of roads, highways, bridges and public transit is the backbone that supports the state's economy. California's surface transportation system needs to provide safe and efficient commutes to work and school, visits with family and friends, and trips to tourist and recreation attractions while simultaneously providing businesses with reliable access for customers, suppliers and employees. With an unemployment rate of 12.5 percent – the fourth highest in the nation - and with the state's population continuing to grow, California must improve its system of roads, highways, bridges and public transit to foster economic growth, avoid business relocations, and ensure the safe, reliable mobility needed to improve the quality of life for all Californians.

As California looks to rebound from the current economic downturn, the state will need to enhance its surface transportation system by improving the physical condition of its transportation network and enhancing the system's ability to provide efficient and reliable mobility for residents, visitors and businesses. Making needed improvements to California's roads, highways, bridges and transit could provide a significant boost to the state's economy by creating jobs and stimulating long-term economic growth as a result of enhanced mobility and access.

California faces enormous challenges in addressing its transportation needs. Urban road conditions are among the roughest in the nation. The state faces crippling traffic congestion, which threatens to impede economic activity and diminish quality of life. The state's public transportation systems are also in disrepair and must be modernized and expanded.

While the needs of the state's highway and transit systems continue to grow, the amount of revenue to address these needs is expected to remain limited, leading to significant challenges in providing a smooth, efficient and well-maintained system of roads, bridges and transit. Despite recent gains in transportation funding, the state still faces an annual highway transportation funding shortfall of approximately \$4 billion. This is in addition to the \$6.9 billion annual shortfall in funds needed to improve and expand the state's public transit system.

As the state lacks adequate funding to improve physical conditions and traffic congestion worsens, meeting California's need to modernize and maintain its system of roads, bridges and public transit will require a significant boost in local, state and federal funding.

Approved in February 2009, one aim of the American Recovery and Reinvestment Act is to stimulate the economy and provide a significant, short-term boost in transportation funding. California's estimated \$3.6 billion in stimulus funding will allow the state to make some needed rehabilitation and improvements to its road, bridge and public transit systems, but this one-time funding boost will not allow the state to proceed with numerous projects needed to modernize its surface transportation system. Even with the aid of stimulus funding, the state will still face a sizeable, on-going transportation funding shortfall.

This report examines the use, condition and funding of California's roads and bridges as well as its public transportation system. Also included in the report are individualized analyses for California's six largest metropolitan areas. These areas are the Los Angeles urban area (which encompasses Los Angeles County and Orange County), Riverside and San Bernardino, Sacramento, San Diego, San Jose, and the San Francisco–Oakland area. These individualized reports cover each respective city and the surrounding metropolitan area and contain regional data on road and bridge conditions, congestion, transit use, transit system conditions and traffic safety, as well as lists of each area's most deteriorated roads and bridges. These regional assessments are included as Appendices A through F in the report. All data used in the report is the latest available.

**California faces an estimated annual transportation funding shortfall of \$10.9 billion to improve the state's roads, bridges and public transportation systems. The state's residents incur a significant cost as a result of roads and highways being congested, deteriorated or lacking some desirable safety features. A failure to eliminate or reduce the state's transportation funding shortfall will likely increase these costs incurred by Californians.**

- According to Caltrans' 2007 Ten-Year Highway Operation and Protection Plan, approximately \$5.5 billion will be needed annually from 2009 to 2018 to operate and rehabilitate the state highway system, a total of \$55 billion over 10 years. However, based on funding projections and the current economic climate, only \$1.5 billion will be available each year during that time, leaving a shortfall of \$40 billion from 2009 to 2018, or \$4 billion each year.
- California faces a transit funding shortfall of approximately \$6.9 billion per year. While \$1.7 billion in funding annually will be available, the state would need approximately \$8.6 billion each year to improve the current conditions and service on its public transportation network.

- TRIP estimates that California's roadways that lack desirable some safety features, have inadequate capacity to meet travel demands or have poor pavement conditions cost the state's drivers approximately \$40 billion annually in the form of traffic crashes, additional vehicle operating costs and congestion-related delays.
- Approved in February 2009, the American Recovery and Reinvestment Act offers a significant, short-term boost in transportation funding in California by providing \$2.57 billion for road and bridge improvements and \$1.07 billion for the state's public transit system. However, this funding is not sufficient to allow the state to proceed with many needed long-term projects that will improve safety, relieve congestion, enhance economic productivity and rehabilitate the state's roadway and transit system.
- Numerous projects needed to maintain and expand the current transportation system will not be able to move forward without a significant, long-term boost in funding at the local, state or federal level.
- Making needed repairs to the state's transportation system can help boost California's economy. A 2007 analysis by the Federal Highway Administration found that every \$1 billion invested in highway construction would support approximately 27,800 jobs, including approximately 9,500 in the construction sector, approximately 4,300 jobs in industries supporting the construction sector, and approximately 14,000 other jobs induced in non-construction related sectors of the economy.
- California's unemployment rate reached 12.5 percent in October 2009, a significant increase since October 2009, when the state's unemployment rate was 5.7 percent.
- California's funding shortfall has been exacerbated by the escalation of the cost of transportation improvements due to rapid increases in the price of key materials needed for highway and bridge construction. The average cost of materials used for highway construction – including asphalt, concrete, steel, lumber and diesel – increased by 33 percent over the five-year period from October 2004 to October 2009.

**Increases in the state's population and rate of vehicle travel have placed additional stress on California's roadways and transit systems, lead to rising congestion and additional deterioration. Traffic congestion in California is a growing burden in key urban areas and threatens to impede the state's economic development.**

- Vehicle travel on California's major highways increased by 22 percent from 1990 to 2008 – jumping from 259 billion vehicle miles traveled (VMT) in 1990 to 315 billion VMT in 2008. Vehicle travel in California is expected to increase by another 20 percent by 2025, reaching approximately 378 billion VMT.
- California's population reached approximately 36.8 million in 2008, an increase of 24 percent and nearly seven million people since 1990. California's population is expected to increase to 49.2 million by 2030, an increase of approximately 12.4 million people.

- From 1990 to 2008, California's gross domestic product (GDP), a measure of the state's economic output, increased by 42 percent, when adjusted for inflation.
- Congestion on California's urban highways is growing as a result of increases in vehicle travel and population. In 2007, 68 percent of California's urban highways were congested, carrying traffic volumes that result in significant rush hour delay.
- The statewide cost of traffic congestion in lost time and wasted fuel is approximately \$18.7 billion annually.

**California has the second highest share of roads in poor condition in the nation. Driving on rough roads costs the state's motorists nearly \$600 per year in extra vehicle operating costs – a total of \$13.5 billion statewide.**

- In 2007, 35 percent of major roads in California were rated in poor condition, the second highest share in the nation, behind only New Jersey. Another 31 percent of the state's major roads were rated in mediocre condition. Major roads include the state's Interstates, freeways and arterials.
- Roads rated in poor condition often have significant rutting, potholes or other visible signs of deterioration and typically need to be resurfaced or reconstructed. Roads rated in mediocre condition show signs of significant wear and may also have some visible pavement distress. Most pavements in mediocre condition can be repaired by resurfacing, but some may need more extensive reconstruction to return them to good condition.
- Roads in need of repair cost each California motorist an average of \$590 annually in extra vehicle operating costs – the second highest amount in the nation and significantly higher than the national average of \$335. Driving on roads in need of repair costs the state's motorists a total of \$13.5 billion each year. These costs include accelerated vehicle depreciation, additional vehicle repair costs, increased fuel consumption and increased tire wear.
- The functional life of California's roads is greatly affected by the state's ability to perform timely maintenance and upgrades to ensure that structures last as long as possible. It is critical that roads are fixed before they require major repairs because reconstructing roads costs approximately four times more than resurfacing them.
- Among all major urban areas in the nation with a population of 500,000 or more, six of the top 10 cities with the roughest pavement conditions are in California.
- This report contains information on pavement conditions in California's major metropolitan areas, including Los Angeles, Riverside and San Bernardino, Sacramento, San Diego, San Jose, and the San Francisco-Oakland area. Also included is a list of the sections of roadway in each of these urban areas that are most deteriorated and in need of repair. These regional assessments can be found in Appendices A through F of the report.

**Twenty-nine percent of California's bridges and overpasses show significant deterioration or do not meet current design standards. This includes all bridges that are 20 feet or more in length and are maintained by state, local and federal agencies.**

- Thirteen percent of California's bridges were structurally deficient in 2008. A bridge is structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. Structurally deficient bridges are often posted for lower weight or closed to traffic, restricting or redirecting commercial trucks and other larger vehicles including emergency service vehicles.
- Sixteen percent of California's bridges were functionally obsolete in 2008. Bridges that are functionally obsolete no longer meet current highway design standards, often because of narrow lanes and shoulders, inadequate clearances or poor alignment.
- The report contains a list of needed bridge rehabilitation and replacement projects across the state that currently lack adequate funding to proceed.
- This report contains information on bridge conditions in California's major cities, including the urban area containing Los Angeles, Long Beach and Santa Ana, the Riverside and San Bernardino urban area, Sacramento, San Diego, San Jose, and the San Francisco-Oakland area. Also included in the report is a list of bridges in each of these areas that are most deteriorated and in need of repair. These regional assessments can be found in Appendices A through F of the report.

**California's rural traffic fatality rate is three times greater than the fatality rate on all other roads in the state. Improving safety features on California's roads and highways would likely result in a decrease in traffic fatalities in the state. Roadway design is an important factor in approximately one-third of all fatal and serious traffic accidents.**

- Between 2004 and 2008, 20,122 people were killed in traffic accidents in California, an average of 4,024 fatalities per year.
- California's traffic fatality rate was 1.09 fatalities per 100 million vehicle miles of travel in 2008.
- The traffic fatality rate in 2008 on California's non-Interstate rural roads was 2.79 traffic fatalities per 100 million vehicle miles of travel, which is more than three times higher than the traffic fatality rate of .84 on all other roads and highways in the state.
- Several factors are associated with vehicle accidents that result in fatalities, including driver behavior, vehicle design and roadway characteristics.
- TRIP estimates that roadway characteristics, such as lane widths, lighting, signage and the presence or absence of guardrails, paved shoulders, traffic lights, rumble strips, obstacle barriers, turn lanes, median barriers and pedestrian or bicycle facilities, are likely a contributing factor in approximately one-third of all fatal and serious traffic crashes.

- Where appropriate, highway improvements can reduce traffic fatalities and accidents while improving traffic flow to help relieve congestion. Such improvements include removing or shielding obstacles; adding or improving medians; adding rumble strips, wider lanes, wider and paved shoulders; upgrading roads from two lanes to four lanes; and better road markings and traffic signals.
- The Federal Highway Administration has found that every \$100 million spent on needed highway safety improvements will result in 145 fewer traffic fatalities over a 10-year period.
- The cost of serious traffic crashes in California in 2008, in which roadway characteristics were a contributing factor, was approximately \$7.6 billion. The costs of serious crashes include lost productivity, lost earnings, medical costs and emergency services.

**The efficiency of California’s transportation system, particularly its highways, is critical to the health of the state’s economy. Businesses are increasingly reliant on an efficient and reliable transportation system to move products and services. A key component in business efficiency and success is the level and ease of access to customers, markets, materials and workers.**

- Approximately \$924 billion in goods are shipped annually from sites in California and another \$894 billion in goods are shipped annually to sites in California, mostly by commercial trucks on the state’s highways.
- Sixty-eight percent of the goods shipped annually from sites in California are carried by trucks and another 19 percent are carried by courier services, which use trucks for part of the deliveries. Similarly, 69 percent of the goods shipped to sites in California are carried by trucks and another 15 percent are carried by courier services.
- Commercial trucking in California is projected to increase 28 percent by 2020.
- Increasingly, companies are looking at the quality of a region’s transportation system when deciding where to relocate or expand. Regions with congested or poorly maintained roads may see businesses relocate to areas with a smoother, more efficient transportation system.
- Businesses have responded to improved communications and greater competition by moving from a push-style distribution system, which relies on low-cost movement of bulk commodities and large-scale warehousing, to a pull-style distribution system, which relies on smaller, more strategic and time-sensitive movement of goods.

*All data used in the report is the latest available. Sources of information for this report include the U.S. Department of Transportation (USDOT), Caltrans, the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the National Surface Transportation Policy and Revenue Study Commission (NSTPRSC), the U.S. Census Bureau, the National Highway Traffic Safety Administration (NHTSA), the Reason Foundation and the Texas Transportation Institute (TTI).*

## **Introduction**

California's system of roads, highways, bridges and public transportation needs to provide the state's residents and visitors with a high level of mobility. As the backbone of the Golden State's surface transportation system, roads, bridges and public transit play a central role in the state's diverse economy and must enable residents and visitors to go to work, visit family and friends, move goods to market, and frequent tourist attractions.

California faces significant challenges in repairing and maintaining its deteriorated system of roads, bridges and public transportation. The modernization of California's surface transportation network is crucial to providing a smooth and efficient transportation system, while improving the economic livelihood of the state and accommodating future growth. As travel on California's surface transportation system becomes more efficient and the physical condition of the system improves, personal and commercial productivity will increase, boosting economic development statewide.

California currently faces a combined annual highway and transit funding shortfall of \$10.9 billion. Without a significant commitment to transportation funding at the state and federal level, many needed projects and improvements can not move forward, jeopardizing California's future mobility and potential for economic development. Even with the added funding the state will receive through the federal economic stimulus package, many key projects remain unfunded at current transportation investment levels.

This report examines the condition, use and funding of California's roads, bridges and public transit systems, as well as the state's ability to meet future mobility and traffic safety needs. In addition to statewide data, this report contains regional analyses for California's six largest urban areas (which includes the cities and surrounding areas). These areas are Los



Angeles, Riverside - San Bernardino, Sacramento, San Diego, San Jose, and the San Francisco – Oakland area. For each of these urban areas, appendices A through F contain road and bridge condition data, lists of the most deteriorated roads and bridges, traffic safety data and information about the condition of various public transportation systems.

Sources of information for this report include the U.S. Department of Transportation (USDOT), Caltrans, the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the U.S. Census Bureau, the National Highway Traffic Safety Administration (NHTSA), the Reason Foundation and the Texas Transportation Institute (TTI). All data is the latest available.

## **Population, Vehicle Travel and Congestion in California**

California's population reached approximately 36.8 million in 2008, an increase of 24 percent and nearly seven million people since 1990. The state's population is expected to increase to 49.2 million by 2030, an increase of approximately 12.4 million people.<sup>1</sup>

From 1990 to 2008, annual vehicle miles of travel (VMT) in the state increased by 22 percent, from approximately 259 billion annual VMT to 315 billion VMT.<sup>2</sup> Based on travel and population trends, TRIP estimates that vehicle travel in California will increase by another 20 percent by 2025, reaching approximately 378 billion VMT.<sup>3</sup>

California also has experienced significant economic growth since 1990. From 1990 to 2008, California's gross domestic product (GDP), a measure of the state's economic output, increased by 42 percent, when adjusted for inflation.<sup>4</sup>

Traffic congestion in California is a growing burden in key urban areas and threatens to impede the state's economic development. Congestion on California's urban highways is growing as a result of increases in vehicle travel and population.

In 2007, 68 percent of California's urban roads and highways were congested, carrying traffic volumes that result in significant rush hour delays.<sup>5</sup> Highways that carry high levels of traffic are also more vulnerable to experiencing significant traffic delays as a result of accidents or other incidents. The statewide cost of traffic congestion in lost time and wasted fuel is approximately \$18.7 billion annually.<sup>6</sup>

Because of increases in the state's population and the rate of travel of its residents, the demands being placed on California's roads and highways far exceed their current capacity. It is critical that California develop and maintain a modern transportation system that can accommodate future growth in population, vehicle travel and economic development.

### **Condition of California's Roads**

Two-thirds of California's roads are in poor or mediocre condition. In 2007, 35 percent of major roads in California were rated in poor condition – the second highest share in the nation.<sup>7</sup> Another 31 percent of the state's major roads were rated in mediocre condition.<sup>8</sup> Major roads include the state's Interstates, freeways and arterials. (MTC)

**Chart 1. States with the highest share of major roads rated in poor condition (2007).**

STATE	Percent Poor
New Jersey	46
California	35
Rhode Island	32
Hawaii	27
Maryland	26

**Source: TRIP analysis of Federal Highway Administration data**

Pavement conditions on the state’s major urban roadways are particularly rough. Among all major urban areas in the nation with a population of 500,000 or more, six of the top 10 cities with the roughest pavement conditions are in California.

**Chart 2. Top ten U.S. cities (>500,000 population) with highest percentage of pavement in poor condition.**

CITY	Percent Poor
Los Angeles	64%
San Jose	61%
San Francisco-Oakland	61%
Honolulu	61%
Concord	54%
New York - Newark	54%
San Diego	53%
New Orleans	49%
Tulsa	47%
Palm Springs-Indio	47%

**Source: TRIP analysis of Federal Highway Administration data**

A desirable goal for state and local organizations that are responsible for road maintenance is to keep 75 percent of major roads in good condition.<sup>9</sup> In California, 18 percent of the state’s major roads were in good condition in 2007.<sup>10</sup>

Roads rated in poor condition often have significant rutting, potholes or other visible signs of deterioration and typically need to be resurfaced or reconstructed. Roads rated in mediocre condition show signs of significant wear and may also have some visible pavement distress. Most pavements in mediocre condition can be repaired by resurfacing, but some may need more extensive reconstruction to return them to good condition.

Pavement failure is caused by a combination of factors, including traffic, moisture and climate, the materials used and the quality of construction. Moisture often works its way into road surfaces and the materials that form the road's foundation. Road surfaces at intersections are even more prone to deterioration because the slow-moving or standing loads occurring at these sites subject the pavement to higher levels of stress.

The functional life of California's roads is greatly affected by the state's ability to perform timely maintenance and upgrades to ensure that structures last as long as possible. Because reconstructing roads costs approximately four times more than resurfacing them, it is critical that roads are fixed before they require major repairs.<sup>11</sup>

In addition to documenting statewide pavement conditions, Appendices A through F of this report also contain separate breakdowns and information on pavement conditions in California's major cities, including the Los Angeles urban area (which includes Los Angeles County and Orange County), the Riverside and San Bernardino urban area, Sacramento, San Diego, San Jose, and the San Francisco – Oakland area. Also included is a list of the sections of roadway in each urban area that are most deteriorated and in need of repair.

## **The Cost to Motorists of Roads in Inadequate Condition**

TRIP has calculated the additional cost to motorists of driving on roads in poor or unacceptable condition. When roads are in poor condition, which may include potholes, rutting or rough surfaces, the cost to operate and maintain a vehicle increases. These additional vehicle operating costs include accelerated vehicle depreciation, additional vehicle repair costs, increased fuel consumption and increased tire wear. TRIP estimates that additional vehicle operating costs borne by California motorists as a result of poor road conditions is \$13.5 billion annually, or \$590 per motorist.<sup>12</sup> This is the second highest cost in the nation and significantly higher than the national average of \$335.<sup>13</sup>

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.<sup>14</sup>

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 increase as roads deteriorate since there is 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 AAA's 2008 vehicle operating costs and then using the HDM model to estimate the

additional vehicle operating costs paid by drivers as a result of substandard roads.<sup>15</sup> Additional research on the impact of road conditions on fuel consumption by the Texas Transportation Institute (TTI) is also factored into TRIP’s vehicle operating cost methodology.

### **Bridge Conditions in California**

California’s bridges and overpasses form key links in the state’s highway system, providing communities and individuals access to employment, schools, shopping and medical facilities, as well as facilitating commerce and access for emergency vehicles. But the state’s bridges and overpasses are aging and deteriorating and a significant number are in need of repair or replacement.

In 2008, 29 percent of California’s 24,112 bridges (20 feet or longer) were rated either structurally deficient or functionally obsolete.<sup>16</sup> Thirteen percent of the state’s bridges were rated structurally deficient and 16 percent were rated as functionally obsolete.<sup>17</sup>

**Chart 3. Bridge Conditions in California, 2008.**

<b>BRIDGE CONDITION</b>	<b>NUMBER OF BRIDGES</b>	<b>PERCENT DEFICIENT</b>
Structurally Deficient	3,199	13%
Functionally Obsolete	3,795	16%
Total Bridges Deficient or Obsolete	6,994	29%

**Source: Federal Highway Administration, National Bridge Inventory**

A bridge is structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. Bridges that are structurally deficient may be posted for lower weight limits or closed if their condition warrants such action. Deteriorated bridges can have a significant impact on daily life. Restrictions on vehicle weight may cause many vehicles – especially emergency vehicles, commercial trucks, school buses and farm equipment – to use alternate routes to avoid posted bridges. Redirected trips also lengthen travel time, waste fuel and reduce the efficiency of the local economy. Bridges that are functionally obsolete no longer meet current highway design standards, often because of narrow lanes, inadequate clearances or poor alignment.

Appendices A through F of this report contain information on bridge conditions in California's major urban areas (which include the city and surrounding areas). These areas are Los Angeles, Riverside and San Bernardino, Sacramento, San Diego, San Jose, and the San Francisco–Oakland area. Also included are lists of bridges in each area that are most deteriorated and in need of repair.

## **Traffic Safety in California**

A total of 20,122 people were killed in motor vehicle crashes in California from 2004 through 2008, an average of 4,024 fatalities per year.<sup>18</sup> In 2008, the number of people killed in motor vehicle crashes dropped to 3,434, the lowest number in 54 years.<sup>19</sup>

California's traffic fatality rate was 1.09 fatalities per 100 million vehicle miles of travel in 2008. The national average of fatalities per 100 million vehicle miles of travel is 1.27, the

lowest rate recorded since data collection of these figures was initiated in 1933 by the California Highway Patrol.<sup>20</sup>

California’s rural, non-Interstate roads have a fatality rate approximately three times higher than all other roads in the state. The traffic fatality rate in 2008 on California's non-Interstate rural roads was 2.79 traffic fatalities per 100 million vehicle miles of travel.<sup>21</sup> The traffic fatality rate per 100 million vehicle miles of travel on all other roads and highways in the state was .84 in 2008.<sup>22</sup>

**Chart 7. Traffic fatalities in California from 2004 – 2008.**

<i>Year</i>	<i>Fatalities</i>
2004	4,120
2005	4,333
2006	4,240
2007	3,995
2008	3,434
<b>Total</b>	<b>20,122</b>

**Source: National Highway Traffic Safety Administration**

Three major factors are associated with fatal vehicle accidents: the vehicle, the driver and the roadway. TRIP estimates that roadway characteristics, such as lane widths, lighting, signage and the presence or absence of guardrails, paved shoulders, traffic lights, rumble strips, obstacle barriers, turn lanes, median barriers and pedestrian or bicycle facilities, are likely a contributing factor in approximately one-third of all fatal and serious traffic crashes.

Improving safety on California’s roadways can be achieved through further improvements in vehicle safety; improvements in driver, pedestrian, and bicyclist behavior; and a variety of improvements in roadway safety features.

The severity of serious traffic crashes could be reduced through roadway improvements such as adding turn lanes, removing or shielding obstacles, adding or improving medians,



widening lanes, adding side or center rumble strips, widening and paving shoulders, improving intersection layout, and providing better road markings and upgrading or installing traffic signals where appropriate.

Roads with poor geometry, with insufficient clear distances, without turn lanes, inadequate shoulders for the posted speed limits, or poorly laid out intersections or interchanges, pose greater risks to motorists, pedestrians and bicyclists.

Traffic accidents and fatalities in which roadway characteristics were a contributing factor cost Californians approximately \$7.6 billion annually, including medical costs, lost economic and household productivity, property damage and travel delays.<sup>23</sup> Roadway characteristic-related safety costs are estimated at \$325 annually per California driver.<sup>24</sup>

The following chart shows the correlation between specific needed road improvements and the reduction of fatal accident rates nationally.<sup>25</sup>

**Chart 8. Reduction in fatal accident rates after roadway improvements nationally.**

Type of Improvement	Reduction in Fatal Accident Rates after Improvements
New Traffic Signals	53%
Turning Lanes and Traffic Signalization	47%
Widen or Modify Bridge	49%
Construct Median for Traffic Separation	73%
Realign Roadway	66%
Remove Roadside Obstacles	66%
Widen or Improve Shoulder	22%

Source: TRIP analysis of U.S. Department of Transportation data

## **Importance of Transportation to Economic Growth**

California relies on an efficient transportation system to support economic development in the state. Reliable transportation access is critical to the health of California's diverse industries, including manufacturing, technology, entertainment, agriculture and tourism.

The new culture of business demands that a region have well-maintained and efficient roads, highways and bridges if it wants to remain economically competitive. The advent of modern national and global communications and the impact of free trade in North America and elsewhere have resulted in a significant increase in freight movement. Consequently, the quality of a region's transportation system has become a key component in a business's ability to compete locally, nationally and internationally.

Businesses have responded to improved communications and the greater necessity to cut costs with a variety of innovations including just-in-time delivery, increased small package delivery, demand-side inventory management, and by accepting customer orders through the Internet. The result of these changes has been a significant improvement in logistics efficiency as businesses move away from a push-style distribution system, which relies on large-scale warehousing of materials, to a pull-style distribution system, which relies on smaller, more strategic movement of goods. These improvements have made mobile inventories the norm, resulting in the nation's trucks literally becoming rolling warehouses.

Highways are vitally important to continued economic development in the Golden State. 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 state's highways and major arterial roads. As international trade continues to grow, modern and efficient

highways are critical around California's border crossings and major distribution centers, as well as the ports of Los Angeles, Long Beach, Oakland, San Francisco and Stockton.

An analysis of commodity transport by the U.S. Bureau of Transportation Statistics (BTS) and U.S. Census Bureau underscored the economic importance of California's road system. The BTS report found \$924 billion in goods are shipped annually from sites in California and another \$894 billion in goods are shipped to sites in California, mostly by commercial trucks on the state's highways.<sup>26</sup> Sixty-eight percent of the goods shipped annually from sites in California are carried by trucks and another 19 percent are carried by courier services, which use trucks for part of the deliveries. Similarly, 69 percent of the goods shipped to sites in California are carried by trucks and another 15 percent are carried by courier services.<sup>27</sup>

Trucking is a crucial part of California's economy, as commercial trucks move goods from sites across the state to markets inside and outside the state. Commercial truck travel in the state is expected to increase significantly over the next two decades. Based on federal projections, TRIP estimates that commercial trucking will increase by 28 percent in California between 2009 and 2020.<sup>28</sup>

## **Transportation Funding in California**

California faces an annual estimated surface transportation funding shortfall of \$10.9 billion.<sup>29</sup> Numerous road, bridge and public transportation system projects needed to maintain and expand the current transportation system will not be able to move forward without a significant, long-term boost in funding at the state or federal level.

According to Caltrans' 2007 Ten-Year Highway Operation and Protection Plan, approximately \$5.5 billion will be needed annually from 2009 to 2018 to operate and rehabilitate the state highway system, a total of \$55 billion over 10 years. However, based on funding projections and the current economic climate, only \$1.5 billion will be available each year during that time, leaving a total shortfall of \$40 billion from 2009 to 2018, or approximately \$4 billion per year.<sup>30</sup>

In addition to the significant gap in highway transportation needs, California faces a transit funding shortfall of approximately \$6.9 billion per year. While \$1.7 billion in annual funding will be available, the state would need approximately \$8.6 billion each year to improve the current conditions and service on its public transportation network.<sup>31</sup>

Approved in February 2009, the American Recovery and Reinvestment Act will offer a significant, short-term boost in transportation funding in California by providing \$2.57 billion for road and bridge improvements and \$1.07 billion for the state's public transit system.<sup>32</sup> However, this funding will not be sufficient to allow the state to proceed with needed long-term projects that will improve safety, reduce congestion and expand capacity.

Without a significant, long-term increase in transportation funding, road and bridge conditions will continue to deteriorate, congestion will worsen, and the condition of the state's public transportation system will decline.

California's funding shortfall has been exacerbated by the escalation of the cost of transportation improvements due to increases in the price of key materials needed for highway and bridge construction. While construction materials costs have stabilized somewhat during the current recession, the average cost of materials used for highway construction – including

asphalt, concrete, steel, lumber and diesel – increased by 33 percent over the five-year period from October 2004 to October 2009.<sup>33</sup>

Making needed repairs to the state’s transportation system can help boost California’s economy. A 2007 analysis by the Federal Highway Administration found that every \$1 billion invested in highway construction would support approximately 27,800 jobs, including approximately 9,500 in the construction sector, approximately 4,300 jobs in industries supporting the construction sector, and approximately 14,000 other jobs induced in non-construction related sectors of the economy.<sup>34</sup>

## **Conclusion**

California faces a significant challenge in the need to modernize and improve its highway and transit system. The state’s system of roads, highways, bridges and public transit play a central role in the Golden State’s economy. Meeting California’s goals for sound economic growth, a high standard of living and strong economic progress will require the state to build and maintain a modern highway and public transit system.

Making needed improvements to California’s surface transportation system could also provide a significant boost to the state’s economy by creating jobs in the short term and stimulating long-term economic growth as a result of enhanced mobility and access.

The federal stimulus package has provided a helpful down payment for the improvement of California’s transportation system. However, without a substantial, long term boost in local, state or federal highway funding, numerous projects to improve the condition and expand the capacity of California’s roads, bridges and highways will not be able to proceed, hampering the

state's ability to improve the condition of its surface transportation system and to enhance economic development opportunities in the state.

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## Endnotes

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- <sup>1</sup> U.S. Census Bureau, Population Division, Interim State Population Projections, 2005.
- <sup>2</sup> U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 1990 and Federal Highway Administration preliminary 2008 VMT estimates.
- <sup>3</sup> TRIP estimate based on analysis of FHWA data.
- <sup>4</sup> TRIP analysis of data from the U.S. Bureau of Economic Analysis. The nation's Gross Domestic Product has been adjusted for inflation based on the Consumer Price Index.
- <sup>5</sup> TRIP analysis of Federal Highway Administration data. Highway Statistics 2007, Table HM-61. Interstate and Other Freeways and Expressways with a volume-service flow ratio above .70, which is the standard for mild congestion, are considered congested.
- <sup>6</sup> TRIP estimate based on analysis of data in the 2009 Urban Mobility Report, Texas Transportation Institute and Highway Statistics, 2007, Federal Highway Administration.
- <sup>7</sup> Highway Statistics, 2007, Federal Highway Administration. HM-63, HM-64.
- <sup>8</sup> Ibid.
- <sup>9</sup> Why We Must Preserve our Pavements, D. Jackson, J. Mahoney, G. Hicks, 1996 International Symposium on Asphalt Emulsion Technology.
- <sup>10</sup> U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2007. HM-63, HM-64. [www.fhwa.dot.gov](http://www.fhwa.dot.gov).
- <sup>11</sup> Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
- <sup>12</sup> TRIP estimate based on calculating share of travel occurring on roads in various conditions and the annual impact on motorists' costs based on estimates provided by AAA.
- <sup>13</sup> Ibid.
- <sup>14</sup> Highway Development and Management: Volume Seven. Modeling Road User and Environmental Effects in HDM-4. Bennett, C. and Greenwood, I. 2000.
- <sup>15</sup> Your Driving Costs. American Automobile Association. 2008.
- <sup>16</sup> Federal Highway Administration – National Bridge Inventory.
- <sup>17</sup> Ibid.
- <sup>18</sup> U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2004-2008 [www.fhwa.dot.gov](http://www.fhwa.dot.gov) and [www-fars.nhtsa.dot.gov](http://www-fars.nhtsa.dot.gov).
- <sup>19</sup> Caltrans in comments provided to TRIP.
- <sup>20</sup> TRIP analysis of 2008 NHTSA and FHWA data and Caltrans.
- <sup>21</sup> TRIP analysis of 2008 NHTSA and FHWA data.
- <sup>22</sup> Ibid.
- <sup>23</sup> TRIP estimate based on National Highway Traffic Safety Administration's CrashCost model.
- <sup>24</sup> Ibid.
- <sup>25</sup> Highway Safety Evaluation System; 1996 Annual Report on Highway Safety Improvement Programs; U.S. Department of Transportation
- <sup>26</sup> 2002 Commodity Flow Survey, U.S. Census Bureau – Bureau of Transportation Statistics. [www.census.gov](http://www.census.gov).
- <sup>27</sup> Ibid.
- <sup>28</sup> TRIP estimated based on U.S. Department of Transportation: Office of Freight Management and Operations. [www.fhwa.dot.gov](http://www.fhwa.dot.gov).
- <sup>29</sup> Caltrans response to TRIP survey.

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<sup>30</sup> Ibid

<sup>31</sup> Ibid.

<sup>32</sup> Federal Highway Administration and Federal Transit Administration estimates.

<sup>33</sup> Bureau of Labor Statistics, 2009. Producer Price Index for Highway and Street Construction.

<sup>34</sup> Federal Highway Administration (2007). Employment Impacts of Highway Infrastructure Investment.