Los Angeles Transportation by the Numbers

MEETING THE REGION'S NEED FOR SAFE, SMOOTH AND EFFICIENT MOBILITY

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TRIP
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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 surface 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 efficient and safe surface transportation.

LOS ANGELES AREA KEY TRANSPORTATION FACTS

THE HIDDEN COSTS OF DEFICIENT ROADS

Driving on Los Angeles area roads that are deteriorated, congested and that lack some desirable safety features costs the average driver $2,995 annually in the form of additional vehicle operating costs (VOC) as a result of driving on rough roads, the cost of lost time and wasted fuel due to congestion, and the financial cost of traffic crashes. California drivers lose a total of $61 billion each year as a result of driving on deficient roads.

LOS ANGELES AREA ROADS PROVIDE A ROUGH RIDE

Due to inadequate state and local funding, 79 percent of all major roads and highways in the Los Angeles area are in poor or mediocre condition. Fifty-seven percent of the area's major urban roads are in poor condition and 22 percent are in mediocre condition. Eleven percent of Los Angeles area roads are in fair condition and ten percent are in good condition. Driving on rough roads costs the average driver in the Los Angeles area $921 annually in extra vehicle operating costs, including accelerated vehicle depreciation, additional vehicle repair costs, increased fuel consumption and increased tire wear. Throughout the state driving on deteriorated roads costs California drivers a total of $14 bilion each year.

LOS ANGELES BRIDGES ARE SHOWING THEIR AGE

More than half – 56 percent – of California's bridges are at least 50 years old – the eighth highest rate in the nation. In the Los Angeles urban area, 176 of 4,703 bridges (20 feet or longer) are structurally deficient, meaning there is significant deterioration of the bridge deck, supports or other major components.

LOS ANGELES DRIVERS WASTE TIME AND FUEL ON CONGESTED ROADS

Traffic congestion costs the average Los Angeles driver $1,774 each year in the form of lost time and wasted fuel. The average Los Angeles area driver loses 82 hours each year – approximately two working weeks stuck in congestion. Congested roads choke commuting and cost California drivers a total of $29.1 billion each year in the form of lost time and wasted fuel.

LOS ANGELES TRAFFIC SAFETY AND FATALITIES

From 2014 to 2016, an average of 876 people were killed annually in traffic crashes in the Los Angeles area. Each Los Angeles driver loses an average of $299 annually in the financial cost of traffic crashes, including work and household productivity losses, property damage, medical costs, rehabilitation costs, legal and court costs, congestion costs, and emergency services in crashes in which roadway features were likely a contributing factor. Throughout the state, traffic crashes in which roadway features were likely a contributing factor imposed $9.8 billion in economic costs in 2016.

CALIFORNIA'S ECONOMY IS RIDING ON ITS TRANSPORTATION SYSTEM

Each year, $2.8 trillion in goods are shipped to and from sites in California, mostly by truck. Increases in passenger and freight movement will place further burdens on the state's already deteriorated and congested network of roads and bridges.

The design, construction and maintenance of transportation infrastructure in California supports 419,790 full-time jobs across all sectors of the state economy. These workers earn $17.8 billion annually. Approximately 7.1 million full-time jobs in California in key industries like tourism, retail sales, agriculture and manufacturing are completely dependent on the state's transportation network.

SB 1 INCREASES CALIFORNIA TRANSPORTATION INVESTMENT

In April 2017, the California legislature enacted SB 1 -- the Road Repair and Accountability Act. SB 1 increased state revenues for transportation by increasing the state's gasoline and diesel taxes, implementing a transportation investment fee on vehicles and initiating an annual fee on zero emission vehicles. It is estimated that SB 1 will increase state revenues for California's transportation system by an average of $5.2 billion annually over the next decade. On November 6, 2018, Californians will vote on Proposition 6, which, if approved, would repeal SB 1. The elimination of SB 1 revenues would reduce funds available in California for transportation projects to improve road, highway and bridge conditions, improve traffic safety, enhance pedestrian and bicycle facilities, improve public transit and relieve traffic congestion.

INTRODUCTION

The Los Angeles area's roads, highways and bridges form vital transportation links for residents, visitors and businesses, providing daily access to homes, jobs, shopping, natural resources and recreation. Modernizing and improving the transportation system is critical to quality of life and economic competitiveness in the Los Angeles area and in California as a whole. Inadequate transportation investment, which will result in deteriorated transportation facilities and diminished access, will negatively affect economic competitiveness and quality of life both locally and throughout the state.

To accommodate population and economic growth, maintain its level of economic competitiveness and achieve further economic growth, California will need to maintain and modernize its roads, highways and bridges by improving the physical condition of its transportation network and enhancing the system's ability to provide efficient, reliable and safe mobility for residents, visitors and businesses. Making needed improvements to California's roads, highways, bridges and transit systems 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.

This report examines the condition, use and safety of the Los Angeles area's roads, highways and bridges, and the area's future mobility needs. Sources of information for this report include the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), the Bureau of Transportation Statistics (BTS), the U.S. Census Bureau, the Texas Transportation Institute (TTI), the American Road & Transportation Builders Association (ARTBA) and the National Highway Traffic Safety Administration (NHTSA).

Corresponding reports for the state of California, and the following urban areas can be accessed by clicking on these links: Bakersfield, Central Valley, Chico-Redding, Concord, Fresno-Madera-Visalia-Hanford, Los Angeles, Riverside-San Bernardino, Sacramento, San Diego, San Francisco-Oakland, San Jose and Santa Barbara-Santa Maria- San Louis Obispo.

An urban area is defined as a region's municipalities and surrounding suburbs for pavement condition and congestion data; bridge and traffic fatality data include a region's major counties.[1]

POPULATION, TRAVEL AND ECONOMIC TRENDS IN CALIFORNIA

Los Angeles motorists and businesses require a high level of personal and commercial mobility. To foster quality of life and spur continued economic growth, it is critical that the state provide a safe

and modern transportation system that can accommodate future growth in population, tourism, business, recreation and vehicle travel.

California's population grew to approximately 39.5 million residents in 2017, a 17 percent increase since 2000.[2] California had approximately 26.2 million licensed drivers in 2016.[3] From 2000 to 2016, California's gross domestic product (GDP), a measure of the state's economic output, increased by 42 percent, when adjusted for inflation.[4] U.S. GDP increased 30 percent during the same period.[5]

From 2000 to 2016, annual vehicle miles of travel (VMT) in the state increased by 11 percent, from 307 billion miles traveled annually to 340 billion miles traveled annually.[6] Vehicle travel in California increased three percent from 2013 to 2016.[7]

CONDITION OF LOS ANGELES AREA ROADS

The life cycle of a roadway system is greatly affected by the state and local governments' ability to perform timely maintenance and upgrades to ensure that road and highway surfaces last as long as possible.

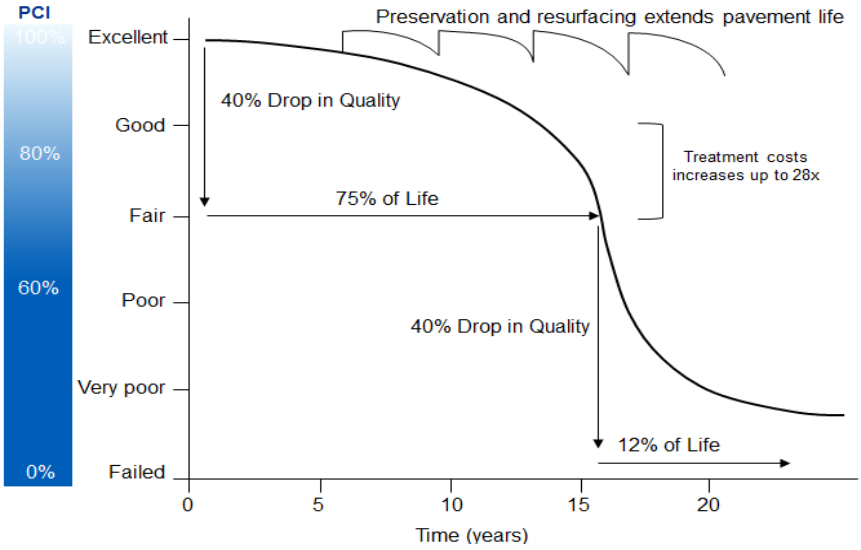
The pavement data in this report, which is for all arterial and collector roads and highways, is provided by the Federal Highway Administration (FHWA), based on data submitted annually by Caltrans on the condition of major state and locally maintained roads and highways. Pavement data for Interstate highways and other principal arterials is collected for all system mileage, whereas pavement data for minor arterial and all collector roads and highways is based on sampling portions of roadways as prescribed by FHWA to insure the data collected is adequate to provide an accurate assessment of pavement conditions on these roads and highways.

In the Los Angeles urban area, 79 percent of major roads are in poor or mediocre condition. Fifty-seven percent of the Los Angeles urban area's major locally and state-maintained roads are in poor condition and 22 percent are in mediocre condition.[8] Eleven percent are in fair condition and the remaining ten percent are in good condition.[9]

Pavement failure is caused by a combination of traffic, moisture and climate. Moisture often works its way into road surfaces and the materials that form the road's foundation. Road surfaces at intersections are more prone to deterioration because the slow-moving or standing loads occurring at these sites subject the pavement to higher levels of stress. It is critical that roads are fixed before they require major repairs because reconstructing roads costs approximately four times more than resurfacing them.[10] As roads and highways continue to age, they will reach a point of deterioration

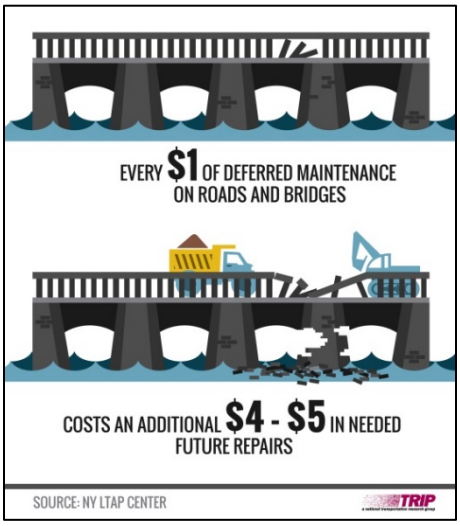
where routine paving and maintenance will not be adequate to keep pavement surfaces in good condition and costly reconstruction of the roadway and its underlying surfaces will become necessary.

Chart 1. Pavement Condition Cycle Time with Treatment and Cost



Source: North Carolina Department of Transportation (2016). 2016 Maintenance Operations and Performance Analysis Report

Long-term repair costs increase significantly when road and bridge maintenance is deferred, as road and bridge deterioration accelerates later in the service life of a transportation facility and requires more costly repairs. A report on maintaining pavements found that every $1 of deferred maintenance on roads and bridges costs an additional $4 to $5 in needed future repairs.[11]



THE COST TO LOS ANGELES AREA MOTORISTS OF ROADS IN INADEQUATE CONDITION

TRIP has calculated the additional cost to motorists of driving on roads in poor, mediocre or fair condition. When roads are in poor, mediocre or fair condition – which may include potholes, rutting or rough surfaces – the cost to operate and maintain a vehicle increases. These additional vehicle

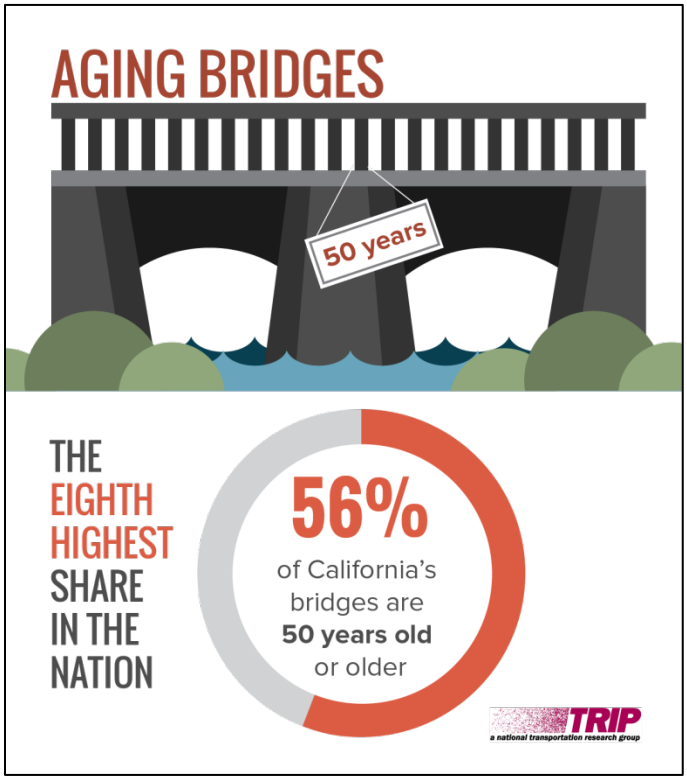
operating costs (VOC) include accelerated vehicle depreciation, additional vehicle repair costs, increased fuel consumption and increased tire wear. TRIP estimates that additional VOC borne by the average driver in the Los Angeles area as a result of deteriorated road conditions is $921 annually – a total of $22.1 billion statewide.[12]

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.[13] 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 VOC estimate is based on taking the average number of miles driven annually by a motorist, calculating current VOC based on AAA's 2017 VOC and then using the HDM model to estimate the additional VOC paid by drivers as a result of substandard roads.[14] Additional research on the impact of road conditions on fuel consumption by the Texas Transportation Institute (TTI) is also factored in to TRIP's vehicle operating cost methodology.

LOS ANGELES BRIDGE CONDITIONS

The Los Angeles area's bridges form key links in the area's highway system, providing communities and individuals access to employment, schools, shopping and medical facilities, and facilitating commerce and access for emergency vehicles.



California's bridges are showing their age. A significant number of California's bridges have surpassed or are approaching 50 years old, which is typically the intended design life for bridges of that age. Fifty-six percent of the state's bridges are 50 years or older, the eighth highest share in the nation.[15] The cost of repairing and preserving bridges increases as they age and as they reach the end of their intended design life.

In the Los Angeles urban area, 176 of 4,703 bridges (20 feet or longer) are structurally deficient, meaning there is significant deterioration to the major components of the bridge. Statewide, 1,603 of 25,657 of California's locally and state-maintained bridges () are rated as structurally deficient.[16] This includes all bridges that are 20 feet or more in length.

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.

The service life of bridges can be extended by performing routine maintenance such as resurfacing decks, painting surfaces, insuring that a facility has good drainage and replacing deteriorating components. But, most bridges will eventually require more costly reconstruction or major rehabilitation to remain operable.

TRAFFIC SAFETY IN THE LOS ANGELES AREA

From 2014-2016, an average of 876 people were killed in traffic crashes each year in the Los Angeles urban area.[17] Three major factors are associated with fatal vehicle crashes: driver behavior, vehicle characteristics and roadway features. It is estimated that roadway features are likely a

contributing factor in approximately one-third of fatal traffic crashes. Roadway features that impact safety include the number of lanes, lane widths, lighting, lane markings, rumble strips, shoulders, guard rails, other shielding devices, median barriers and intersection design.

California's overall traffic fatality rate of 1.07 fatalities per 100 million vehicle miles of travel in 2016 is lower than the national average of 1.18.[18]

The average driver in the Los Angeles area loses $299 each year in the financial cost of traffic crashes in which roadway features were lkely a contributing factor.[19] According to a 2015 National Highway Traffic Safety Administration (NHTSA) report, the economic costs of traffic crashes includes work and household productivity losses, property damage, medical costs, rehabilitation costs, legal and court costs, congestion costs and emergency services.[20]

Traffic crashes in California imposed a total of $29.4 billion in economic costs in 2016.[21] TRIP estimates roadway features were likely a contributing factor in approximately one-third of all fatal traffic crashes, resulting in $9.8 billion in economic costs in California in 2016.[22]

Improving roadway safety 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, where appropriate, such as adding turn lanes, removing or shielding obstacles, adding or improving medians, widening lanes, widening and paving shoulders, improving intersection layout, and providing better road markings and upgrading or installing traffic signals. Roads with poor geometry, with insufficient clear distances, without turn lanes, having inadequate shoulders for the posted speed limits, or poorly laid out intersections or interchanges, pose greater risks to motorists, pedestrians and bicyclists.

Investments in rural traffic safety have been found to result in significant reductions in serious traffic crashes. A 2012 report by TTI found that improvements completed recently by TxDOT that widened lanes, improved shoulders and made other safety improvements on 1,159 miles of rural state roadways resulted in 133 fewer fatalities on these roads in the first three years after the improvements were completed (as compared to the three years prior).[23] TTI estimates that the improvements on these roads are likely to save 880 lives over 20 years.[24]

TRAFFIC CONGESTION IN THE LOS ANGELES AREA

Increasing levels of traffic congestion cause significant delays throughout California, particularly in its larger urban areas, choking commuting and commerce. In the Los Angeles urban area, the average driver loses $1,774 each year in the form of lost time and wasted fuel as a result of traffic congestion. [25] The average Los Angeles driver loses 82 hours each year stuck in traffic congestion.[26]

Traffic congestion robs commuters of time and money and imposes increased costs on businesses, shippers and manufacturers, which are often passed along to the consumer. Increased levels of congestion can also reduce the attractiveness of a location to a company when considering expansion or where to locate a new facility.

Eighty-five percent of California's urban Interstates are congested.[27] Based on TTI methodology, TRIP estimates the value of lost time and wasted fuel in California is approximately $29.1 billion per year.[28]

TRANSPORTATION AND ECONOMIC GROWTH

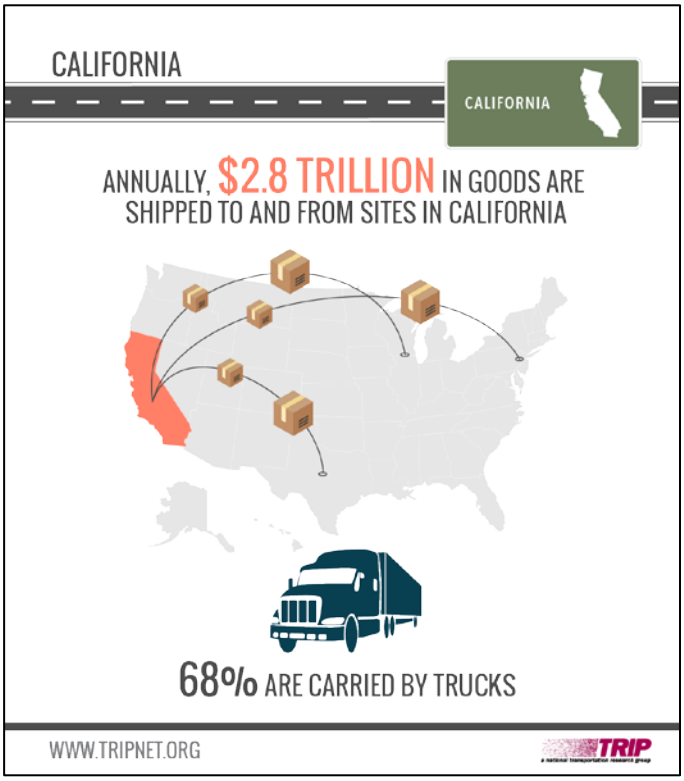
Today's culture of business demands that an area have well-maintained and efficient roads, highways and bridges if it is to remain economically competitive. Global communications and the impact of free trade in North America and elsewhere have resulted in a significant increase in freight movement, making the quality of a region's transportation system a key component in a business' ability to compete locally, nationally and internationally.

Businesses have responded to improved communications and the need to cut costs with a variety of innovations including just-in-time delivery, increased small package delivery, demand-side inventory management and e-commerce. The result of these changes has been a significant improvement in logistics efficiency as firms move 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 California. 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.

Every year, $2.8 trillion in goods are shipped to and from sites in California, mostly by trucks.[29] Sixty-eight percent of the goods shipped annually to and from sites in California are carried by trucks and another 19 percent are carried by courier services or multiple-mode deliveries, which include trucking.[30]



The design, construction and maintenance of transportation infrastructure in California play a critical role in the state's economy, supporting the equivalent of 419,790 full-time jobs across all sectors of the state economy, earning these workers approximately $17.8 billion annually.[31] These jobs include 209,126 full-time jobs directly involved in transportation infrastructure construction and related activities as well as 210,665 full-time jobs as a result of spending by employees and companies in the transportation design and construction industry.[32]

Transportation construction in California annually contributes an estimated $3.2 million in state and local income, corporate and unemployment insurance taxes and the federal payroll tax.[33]

Nearly 7.1 million full-time jobs in California in key industries like tourism, retail sales, agriculture and manufacturing are dependent on the quality, safety and reliability of the state's transportation infrastructure network. These workers earn $319 billion in wages and contribute an estimated $58.2 billion in state and local income, corporate and unemployment insurance taxes and the federal payroll tax.[34]

Local, regional and state economic performance is improved when a region's surface transportation system is expanded or repaired. This improvement comes as a result of the initial job creation and increased employment created over the long-term because of improved access, reduced transport costs and improved safety.

Increasingly, companies are looking at the quality of a region's transportation system when deciding where to re-locate or expand. Regions with congested or poorly maintained roads may see businesses relocate to areas with a smoother, more efficient and more modern transportation system. Highway accessibility was ranked the number one site selection factor in a 2017 survey of corporate executives by Area Development Magazine. Labor costs and the availability of skilled labor, which are both impacted by a site's level of accessibility, were rated second and third, respectively.[35]

TRANSPORTATION FUNDING

Investment in California's roads, highways and bridges is funded by local, state and federal governments. A lack of sufficient funding at all levels will make it difficult to adequately maintain and improve the state's existing transportation system.

In April 2017, the California legislature enacted SB 1 -- the Road Repair and Accountability Act. SB 1 increased state revenues for transportation by increasing the state's gasoline and diesel taxes, implementing a transportation investment fee on vehicles and initiating an annual fee on zero emission vehicles.[36] It is estimated that SB 1 will increase state revenues for California's transportation system by an average of $5.2 billion annually over the next decade.[37] Each year, the SB 1 funding package is expected to provide an additional: $1.8 billion for the maintenance and rehabilitation of state-maintained highways; $1.7 billion for the maintenance and rehabilitation of locally maintained roads and streets; $750 million for improvements to public transit; $380 million for traffic congestion relief including roadway capacity expansion; $310 million for improvements to freight corridors; $100 million for improved pedestrian and bicycling facilities; and, $25 million for freeway service patrols.[38] On November 6, 2018, Californians will vote on Proposition 6, which, if approved, would repeal SB 1. The elimination of SB 1 revenues would reduce funds available in California for transportation projects to improve road, highway and bridge conditions, improve traffic safety, enhance pedestrian and bicycle facilities, improve public transit and relieve traffic congestion.

CONCLUSION

As California works to build and enhance a thriving, growing and dynamic state, it will be critical that it is able to address the state's most significant transportation issues by providing a 21st century network of roads, highways, bridges and transit that can accommodate the mobility demands of a modern society.

California will need to modernize its surface transportation system by improving the physical condition of its transportation network and enhancing the system's ability to provide efficient, safe and reliable mobility for residents, visitors and businesses. Making needed improvements to the state's roads, highways, bridges and transit systems would provide a significant boost to the economy by creating jobs in the short term and stimulating long-term economic growth as a result of enhanced mobility and access.

The approval of SB 1 in 2017 has allowed California to increase its annual investment in roads, bridges, highways, transit systems, bike paths and pedestrian facilities by $5.2 billion annually. Maintaining this higher level of transportation funding will be critical in allowing the state to improve road and bridge conditions, relieve traffic congestion and improve traffic safety. If California is unable to maintain its current level of transportation investment, the cost to the public of deficient roads, traffic congestion, and a lack of adequate roadway safety will increase and economic development opportunities and quality of life in the Golden State will be diminished.

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ENDNOTES

[1] Bridge condition data and safety data for each urban area includes the counties noted: Bakersfield: Bakersfield County; Central Valley: Merced, San Joaquin and Stanislaus Counties; Chico-Redding: Butte, Shasta and Tehama Counties; Concord: Contra Costa County; Fresno-Madera-Visalia: Fresno, Kings, Madera and Tulare Counties; Los Angeles: Los Angeles and Orange Counties; Riverside-San Bernardino: Riverside and San Bernardino Counties; Sacramento: El Dorado, Placer, Sacramento and Yolo Counties; San Diego: San Diego County; San Francisco-Oakland: Alameda, Marin, San Francisco and San Mateo Counties; San Jose: San Benito and Santa Clara Counties; Santa Barbara-Santa Maria-San Luis Obispo: Santa Barbara and San Luis Obispo Counties.
[2] U.S. Census Bureau (2017).
[3]Highway Statistics (2016). Federal Highway Administration. DL-1C.
[4] TRIP analysis of Bureau of Economic Analysis data.
[5] Ibid.
[6] U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2000 and 2016 and analysis of Federal Highway Administration Traffic Volume Trends (2016)
https://www.fhwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm
[7] U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2013 and analysis of Federal Highway Administration Traffic Volume Trends (2016)
https://www.fhwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm
[8] Federal Highway Administration (2017). Pavement condition data is for 2016.
[9] Ibid.
[10] Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
[11] Pavement Maintenance, by David P. Orr, PE Senior Engineer, Cornell Local Roads Program, March 2006.
[12] TRIP calculation.
[13] Highway Development and Management: Volume Seven. Modeling Road User and Environmental Effects in HDM-4. Bennett, C. and Greenwood, I. 2000.
[14] Your Driving Costs. American Automobile Association. 2017.
[15] Ibid.
[16] Federal Highway Administration National Bridge Inventory. 2017.
[17] Federal Highway Administration National Highway Traffic Safety Administration, 2014-2016.
[18] TRIP analysis of National Highway Traffic Safety Administration and Federal Highway Administration data (2017). Data is for 2016.
[19] TRIP estimate based on NHTSA report "The Economic and Societal Impact of Motor Vehicle Crashes, 2010 (Revised), 2016. P. 146.
[20] The Economic and Societal Impact of Motor Vehicle Crashes, 2010 (Revised) (2015). National Highway Traffic Safety Administration. P. 1. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812013
[21] TRIP estimate based on NHTSA report "The Economic and Societal Impact of Motor Vehicle Crashes, 2010 (Revised), 2016. P. 146.
[22] Ibid.
[23] Adding Highway Shoulders, Width, Reduce Crash Numbers and Save Lives (August 9, 2012). Texas Transportation Institute. https://tti.tamu.edu/2012/08/09/tti-study-analyzes-roadway-improvements/
[24] Ibid.
[25] TRIP estimates based on Texas Transportation Institute Urban Mobility Report.
[26] Ibid
[27] Federal Highway Administration Highway Statistics 2016.
[28] Ibid
[29] TRIP analysis of Bureau of Transportation Statistics, U.S. Department of Transportation. 2012 Commodity Flow Survey, State Summaries.
[30] Ibid.
[31] American Road & Transportation Builders Association (2015). The 2015 U.S. Transportation Construction Industry Profile. https://www.transportationcreatesjobs.org/pdf/Economic_Profile.pdf
[32] Ibid.

[33] Ibid
[34] Ibid.
[35] Area Development Magazine (2018). 32nd Annual Survey of Corporate Executives: Availability of Skilled Labor New Top Priority. http://www.areadevelopment.com/Corporate-Consultants-Survey-Results/Q1-2018/32nd-annual-corporate-survey-14th-annual-consultants-survey.shtml
[36] Legislative Analyst's Office (2018). Overview of the 2017 Transportation Funding Package. http://lao.ca.gov/Publications/Report/3688
[37] Ibid.
[38] Ibid.