CALIFORNIA GRADES

GPA **C-**

AVIATION	C+	PORTS	C+
BRIDGES	C-	PUBLIC PARKS	D+
DAMS	C-	RAIL	C
DRINKING WATER	C	ROADS	D
ENERGY	D-	SCHOOLS	C
HAZARDOUS WASTE	C-	SOLID WASTE	C-
INLAND WATERWAYS	D	STORMWATER	D+
LEVEES	D	TRANSIT	C-
		WASTEWATER	C+

ABOUT THE GRADES

Across the country, budget issues and deferred maintenance are taking their toll on critical infrastructure systems constructed by the generations before us and which now must be maintained and modernized. The analysis in this report card and associated grades are intended to increase understanding by the public and the state and local legislators of the importance and value of long-term consistent infrastructure investments, the role of leadership and planning, and the need to prepare for the future. The grades reflect the condition of the infrastructure, and not the diligent local agency personnel who are doing their best to manage, repair, renew, and replace aging systems, with the limited available resources. This Report Card is intended to reflect current infrastructure conditions and be a tool to help agencies request and receive the resources they need.

The 2019 Report Card for California's Infrastructure was completed by a committee of over 100 professionals and experts from California who dedicated their valuable time to collect and evaluate existing data, assess the infrastructure, document their findings, and develop recommendations. The committee worked with staff from ASCE National and ASCE's Committee on America's Infrastructure to provide a snapshot of our infrastructure, as it relates to us at home, and on a national basis.

A	B	C	D	F
Exceptional, Fit for the Future	Good, Adequate for Now	Mediocre, Requires Attention	Poor, At Risk	Failing/ Critical, Unfit for Purpose

WHAT CAN WE DO TO RAISE THE GRADES?

To raise California's infrastructure grade, ASCE developed the following four recommendations:

1. **PROMOTE EFFECTIVE AND COLLABORATIVE LEADERSHIP** ASCE encourages all levels of government, business, labor, and nonprofits to collaborate to address challenges associated with California's aging infrastructure. Effective leadership within agencies is critical, and those individuals should be empowered with applicable decision-making authority. Streamlining the project permitting process across infrastructure is also necessary, with safeguards to protect the national environment.

2. **DEVELOP SMART PLANS TO BETTER IDENTIFY FUNDING NEEDS** Asset management plans enable state and local agencies to make informed decisions on where – and when to spend limited public funds. Policies should be enacted that require high quality data gathering and regularly scheduled maintenance. Further, life cycle cost analysis and risk analysis, which are valuable strategies to extending the lifespan of an asset and saving the taxpayer money in the long run, should be employed for projects costing greater than $5 million.

3. **INCREASE STATE AND LOCAL FUNDING** Each category evaluated in this report indicates currently available funding to state and local agencies is not adequate to maintain sustainable and safe California infrastructure systems. Long-term funding strategies should be established, based on new and sustained revenue sources, including local and state revenue. Incentives may be appropriate, and adequate funding for innovative new materials, technologies, and processes is imperative.

4. **INFORM THE PUBLIC AND RAISE AWARENESS** There is a need for additional consumer education on the current funding needs and the negative impacts of delaying action to fund infrastructure improvements statewide. The education needs to also extend to the local and state legislators, locally elected boards and commissions, as well as to the media.

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REPORT CARD FOR CALIFORNIA'S INFRASTRUCTURE

2019

CALIFORNIA'S INFRASTRUCTURE REPORT CARD

MAY 2019

ASCE

AMERICAN SOCIETY OF CIVIL ENGINEERS

WHY IS INFRASTRUCTURE IMPORTANT TO US?

Californians use infrastructure each day. Our roads, bridges, and transit networks allow us access to our iconic coastlines, lakes, and vineyards. Water systems deliver clean drinking water to our homes, communities, and businesses. School buildings provide a safe place for our children to learn. Wastewater collection and treatment systems protect our lakes, rivers, and beaches from raw sewage, E. coli and other toxins.

Our infrastructure systems play a critical role in continued economic prosperity and the preservation of our quality of life. Unfortunately, our state's infrastructure renewal and replacement programs have been significantly underfunded for a long time. While the state Legislature, municipalities, and California voters have made strides in recent years to raise additional revenue for our infrastructure, we have a lot of catch-up to do, and **large funding gaps remain**.

Additionally, we're facing significant new challenges. In May 2018, California's economy surpassed that of the United Kingdom to become the world's fifth largest. Over the next 20 years, California's population is expected to grow by another 25% by over 10 million people. This economic activity and new population requires additional supporting infrastructure. Meanwhile, the climate is changing. California is already grappling with precipitation whiplash – extreme periods of drought followed by extreme periods of rainfall – and sea level rise and increasingly severe storms are also expected.

As the stewards of our infrastructure, **California's civil engineers have a moral duty to advocate for sustainable infrastructure capable of supporting our state's robust economy, while maintaining public safety and our quality of our life.** Join us in our mission to increase infrastructure investment to repair our existing networks and plan for California's future.

THE FULL STORY

1. Get the full story behind this Report Card at infrastructurereportcard.org/california.

2. Find out the condition of the infrastructure near you on the Save America's Infrastructure app available on the Apple App store and GooglePlay.

2019 CALIFORNIA'S INFRASTRUCTURE REPORT CARD

The 2019 Report Card for California's Infrastructure gave the state an overall GPA of C-. The good news is there are solutions to these challenges and we can raise California's infrastructure grades.

AVIATION — C+

California has 26 commercial service airports and 217 general aviation airports. Based on the Federal Aviation Administration passenger boarding data, 11 airports in California rank nationally within the top 100 Commercial Service Airports, with Los Angeles International Airport ranking second nationally and San Francisco International Airport ranking seventh. The condition of the runways at California airports is healthy, but the airport capacity remains a challenge. On average, 17% of flights were delayed at the 11 busiest airports in California in 2017, just under the national average of 18% the same year. Looking ahead, sufficient investment in commercial and general aviation airports is needed to keep pace with a growing economy and population. According to the 10-year California Capital Improvement Plan published in 2017, there are 1,735 aviation projects that need a total of $2.77 billion in funding over the next 10 years.

BRIDGES — C-

Progress has been made over the past decade to increase the percentage of California bridges in good condition and to reduce the number that are classified as structurally deficient (SD). Today, California has fewer SD bridges than the national average, and this number is expected to continue declining thanks to the passage of the Road and Repair Accountability Act (SB 1), which increased funding for badly-needed repairs to the state's transportation system. However, much more remains to be done, especially as it relates to seismic retrofitting to improve the safety of bridges in the event of an earthquake. Approximately 50% of bridges in the state have exceeded their design life and the backlog of recommended maintenance, repair and replacement work continues to grow. California is home to the second largest percentage of "functionally obsolete" (FO) bridges, or bridges with outdated designs that frequently contribute to congestion chokepoints. Over 7% of California's bridges are structurally deficient and California has ranks among the top states for bridges in "poor" condition by bridge deck area. In other words, some of our largest bridges, along corridors such as I-5 in San Diego, Highway 101 in Los Angeles, and I-80 in Sacramento need major repair and rehabilitation.

DAMS — C-

Dams are a critical element of California's infrastructure. The public depends on them for 70% of state's water supply, 15% of the power, as well as for flood control, recreation, fisheries and wildlife habitat. Changes in climate and population growth require new operational strategies. Over half of California's 1,476 state, federal and locally owned dams are considered high hazard dams, meaning their failure would result in probable loss of human life and economic damage. Approximately 70% of the dams are greater than 50 years old. Aging dam infrastructure challenges must be met with increased resources to ensure their reliability and safety. Fortunately, funding for dam inspection has increased in recent years. In 2015, the California Division of Safety of Dams (DSOD) budget was approximately $13 million, up from $11 million in 2010. This increase kept funding on par with inflation. However, while DSOD's budget is significantly higher per regulated dam than the national average, it does not fully fund the necessary programs to ensure adequate dam safety.

DRINKING WATER — C

Providing effective water supply and treatment in California has always been challenging due to great variations in water availability and demand from year to year across the state. Historically, California has adapted to this challenge by building a vast network of water storage and conveyance facilities. Today, much of this network is aging. In San Francisco, approximately 150 of the 1,200 miles of water mains are over 100 years old. The Los Angeles Department of Water and Power reports that approximately 28% of the city's 6,780 mainline pipes were installed before 1938. And while California's urban centers generally have state-of-the-art water treatment facilities, many of the state's rural areas are dependent on wells, many of which are inadequate in dry years. To fund and finance necessary drinking water infrastructure projects, water rates have risen, and voters passed both Proposition 1 and Proposition 68 to finance water quality and supply projects. While the additional revenue is helpful, it does not cover all needs throughout the state.

ENERGY — D-

California receives and generates energy through a variety of sources, primarily from natural gas, nuclear, and utility-scale solar and wind. Although under duress, California's energy systems have generally met the needs of consumers. However, the threat of natural and anthropogenic stresses, including fires, seismic events, storms, and gas storage mishaps, as well as the elevated cost of service, threaten energy system sustainability. Aging equipment, inferior design, and poor right-of-way vegetation management have caused electrical and oil/gas infrastructure incidents and, in some cases, resulted in deadly wildfires. In another trend, the increased renewable energy contribution has had dramatic impacts on the overall capacity of the California electric grid. California now has a legislatively-mandated target of 100% clean energy by 2045, but the true cost of building infrastructure to support this goal is unknown. Meanwhile, natural gas continues to help meet peak electric and heating demands, but the state depends on in-state production and imports that requires extensive processing resulting in high pricing to the consumer.

HAZARDOUS WASTE — C-

California's hazardous waste infrastructure principally consists of the management of generated hazardous wastes and the cleanup of contaminated sites. In 2017, California entities generated 3.8 million tons of hazardous waste and cleaned up 1,800 contaminated sites. It is estimated that 90,000 properties in California are contaminated with some level of toxic substances. The cost of operating California's existing hazardous waste infrastructure is around $3.4 billion per year, with most of this funding coming from the private sector. The results of this spending are improved human health and a cleaner environment. Economic benefits result from reduced health-care costs for exposure-related illness and increased land values—putting surplus land towards productive reuses such as housing and conservation, and returning hazardous recyclables back into industrial production. The infrastructure is challenged by the fluctuating funding levels, new contaminants and new knowledge of health effects, a vast increase in use of consumer electronics, and rising compliance costs for private businesses and public entities. California does not meet its own hazardous waste disposal needs. Over half of all hazardous waste generated is exported to surrounding states for landfill disposal.

INLAND WATERWAYS — D

The U.S. Army Corp of Engineers operates and maintains two inland waterways in California: the Sacramento Deep Water Ship Canal (Sacramento DWSC), and the Stockton Deep Water Ship Channel (Stockton DWSC). Both waterways face similar issues of being neither wide enough nor deep enough for larger ships. Construction costs for projects to deepen the two waterways are estimated at $17 million for the Sacramento DWSC and between $175 and $225 million for the Stockton DWSC. Both projects have been on hold since 1990, while no funding is programmed for future fiscal years. Meanwhile, the current Sacramento DWSC width is unsafe, particularly for marine vessels navigating the canal in inclement weather. There are significant opportunities for improvement for both waterways when considering seismic readiness, ecological hazards, and lack of necessary inspections.

LEVEES — D

Over the last six years, unprecedented funding was invested in California's aging levee system, and many miles of levee were improved during that time. Yet the fiscal impacts of climate change, increased regulatory pressure, more rigorous maintenance, updated safety standards and higher cost estimates render this investment a mere down payment on the much larger bill. A capital investment of $45 billion is needed to rehabilitate and improve California's levees, and unfortunately, the path to this funding is unclear. Local agencies currently spend $1.3 billion annually on all flood management activities. However, additional annual funding of at least $100 million is necessary to repair infrequent but inevitable flood damage.

PORTS — C+

California ports play a vital role in maintaining waterborne trade essential to the nation's economy. In 2017, California's ports handled 40% of all containerized cargo entering the U.S. and 30% of the nation's exports. Since 2012, maritime traffic volumes have increased by over 16%, while other factors have also begun impacting port operations: the need to protect against potentially catastrophic natural disasters such as earthquakes and sea-level rise, increased demands for security and emergency management, tighter regulatory requirements including air quality regulations, and modernization to incorporate new technologies to maintain competitiveness. California ports are in satisfactory condition for the time being, but require significant improvements to maintain existing conditions and meet new demands. The funding gap is estimated at $ 10.7 billion over the next 10 years, and available revenue has been insufficient to fill the gap as needs continue to outpace available funds.

PUBLIC PARKS — D+

California is home to 28 national parks and monuments, two World Heritage Sites, 284 state parks, and 14,000 local parks managed by nearly 1,000 agencies. In total, 47 million acres of outdoor recreational areas and local parks are enjoyed by residents of, and visitors to, the state. Unfortunately, park budgets have declined significantly as a result of the 2008 recession and infrastructure deficiencies have been on the rise. Deferred maintenance at state parks is estimated at $1.2 billion, while local parks report an estimated $1 billion in unmet needs. The National Parks Service estimates the maintenance backlog for its parks in California is $1.8 billion. Meanwhile, access to parks continues to be insufficient. Sixty two percent of Californians live in areas that do not meet the California Department of Parks and Recreation recommendation of three acres of park land per 1,000 residents. Fortunately, the tide is turning, as voters approved Proposition 68 in 2018, which will provide $4 billion in bonds for state and local parks and water projects.

RAIL — C

California is home to an extensive network of freight and passenger rail. A major portion of California's passenger rail system operates on right-of-way owned by Class I freight railroads, which are also the major carrier of freight in the state. Passenger rail systems and smaller freight carriers (Class II and III), to a lesser degree, rely on public funding for operations and maintenance. Class I freight railroads are able to fund maintenance and capital investment from their revenues, and generally operate on infrastructure that is in good condition. Progress is being made on safety related Positive Train Control (PTC) systems and most of the state's railroads implemented the service by the December 31, 2018 statutory deadline. However, some of the challenges that remain include lack of adequate funding for grade crossing safety programs, and commuter rail and state-supported intercity passenger rail that lack a dedicated revenue source for operations, maintenance, and capital investment programs. California, and the public agencies managing passenger rail systems, are working to remedy the issues regarding funding, interconnectivity, and capital investment, which have been outlined in the 2018 California State Rail Plan.

ROADS — D

Driving on deficient roads costs Californians $61 billion annually due to congestion-related delays, traffic collisions, and increased vehicle operating costs caused by poor road conditions. The condition of California roads is among the worst in the nation, ranking 49th according to the latest US News & World Report Ranking. Meanwhile, Southern California and the Bay Area are the second and third most congested urban areas in the nation, respectively. Repair and improvement to these roads is vital to California's economic health and public safety. The Road and Repair Accountability Act (SB 1) passed in April 2017, provides $52 billion in additional funds for local and state roads over the next 10 years. However, a total of more than $130 billion over that same time is needed to bring the system back to a state of good repair. A good transportation system enables efficient movement of goods and people and is critical to California's economic well-being.

SCHOOLS — C

There are 1,026 school districts in California and over 10,000 public elementary and secondary schools serving more than 6,220,000 students statewide. In some municipalities, capacity is sufficient and overall population is declining, while in others, new facilities to accommodate growing enrollment rates are required. Today, most of California's K-12 school facilities are in fair to good condition thanks to upgrades to structures, roofing systems, fire alarms, ADA access, electrical, HVAC and technology. However, the outdoor environment of the K-12 school facilities, including parking lots, play areas and playfield areas, are only in fair condition. Looking ahead, there is a lack in adequate funding for future routine and major maintenance issues.

SOLID WASTE — C-

California has adequate infrastructure for the minimization, collection, processing, recycling, and disposing of solid waste to protect human health, public safety, and the environment with its 1,390 existing solid waste facilities and operations. However, the existing infrastructure is inadequate to meet existing and recent legislative and regulatory solid waste reduction and recycling goals. While well intentioned, these aspirational policies are being implemented without sufficient markets, planning, infrastructure development and funding, and consideration of recent restrictions by other countries on imported recyclables. Overall, the condition of the solid waste category has declined significantly in recent years, largely due to the insufficient infrastructure to meet new recycling goals and adequately manage the improper discharge of solid waste to the environment. California is considering policies to reduce both the generation and disposal of solid waste including greater manufacturer responsibility, waste reduction, improved recyclability, and increased waste fees. These approaches would likely be implemented through future legislation and regulations that would impose mandated restrictions on solid waste generation and handling, as well as penalties on stakeholders failing to comply. More importantly, California needs to refocus its attention on technologies and internal markets that can help meet its recycling goals/policies, including waste conversion technologies to safely and cost-effectively convert waste residuals (organics, paper, plastics) into low carbon fuels, energy, and chemicals.

STORMWATER — D+

Stormwater infrastructure in California includes storm drains, pipes, ditches, canals, and channels. It also includes green infrastructure like vegetated areas that provide habitat, flood protection, cleaner air and cleaner water. Much of the drainage infrastructure in California was constructed prior to the 1940s and needs repair or replacement. Further, the new and innovative drainage systems necessary to meet water quality standards and promote a sustainable environment are significantly underfunded. For example, over the next 20 years in Los Angeles County the cost of achieving water quality objectives is estimated at about $20 billion, and in San Diego County, it is estimated at about $5 billion. Clean water is fundamental to our way of life in California and significant investment is needed to insure sustainable clean water for future generations.

TRANSIT — C-

California needs robust, flexible, and reliable transit systems to reduce peak congestion on our highways, provide options for citizens who do not drive, and improve air quality. Public transit in California provides nearly 1.5 billion trips annually on 139 transit systems throughout the state. The California Transportation Commission estimated in 2011 the state needed approximately $174 billion for expansion and state of good repair transit projects over the next 10 years, but at the time only 45% of funding had been identified, leaving a shortfall of $96 billion. Fortunately, recent legislative initiatives and ballot measures are attempting to close the funding gap, including an additional $750 million annually for transit agencies across the state provided through the Road and Repair Accountability Act of 2017 (SB 1). Adequate resources must be provided to our transit systems or we risk retreat on sustainability gains as well as the current state of good repair.

WASTEWATER — C+

California wastewater systems serve a population of 40 million in over 13 million homes and treat 4 billion gallons of sewage per day while protecting surface waters, the coastline and public health. There are approximately 900 publicly-owned collection and treatment systems, while approximately 10% of the population is served by onsite wastewater systems such as septic tanks. The average age of collection system pipes and manholes is approximately 40 years. Most, although not all, systems and treatment plants appear to have adequate capacity and are prepared to meet the population needs for the next 10 to 20 years. Modest progress has been made in recent years to prioritize and invest in wastewater infrastructure. For example, in 2014 Proposition 1 authorized over $7.5 billion in general obligation bonds to fund ecosystems and watershed protection and restoration projects. California also continues to advance in technologies aimed at treating and discharging wastewater at a higher water quality standard. However, the cost to maintain wastewater systems continues to rise with the age of the systems. We must maintain the condition of the infrastructure, meet discharge requirements, and continue elimination of sanitary sewer overflows.

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