

MISSOURI GRADE SUMMARY

AVIATION



C

BRIDGES



C

DAMS



D-

DRINKING WATER



C-

ENERGY



D+

INLAND WATERWAYS



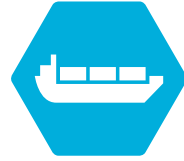
D

LEVEES



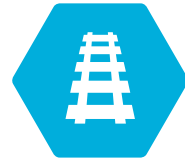
D+

PORTS



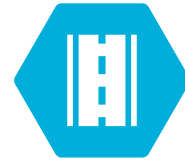
C

RAIL



C

ROADS



D+

STORMWATER/WASTEWATER



C-

G.P.A.



C-

About the Grades

Infrastructure is graded based on eight criteria: capacity, condition, funding, future need, operation and maintenance, public safety, resilience, and innovation. ASCE grades on the following scale and defines these grades as:



A EXCEPTIONAL,
Fit for the
Future



C MEDIOCRE,
Requires
Attention



B GOOD,
Adequate
for Now



D POOR,
At Risk



F FAILING/
CRITICAL,
Unfit for Purpose

STEPS WE CAN TAKE

- 1 Increase state-level transportation investment.** If we don't increase state funding for roads and bridges, Missouri will lose out on matching federal funds. This would be costly to our economy. By proactively increasing investment, we will maximize other sources of funding to meet future needs.
- 2 Missouri needs a more systematic approach to flood prevention.** The disjointed approach to improving levee systems has reduced flooding potential for some communities, but increased flooding risks for others. Better coordination and increased funding through the National Levee Safety Initiative would more comprehensively mitigate flood risk.
- 3 Eliminate regulation exemptions for high-hazard and significant-hazard dams.** An estimated 68% of high-hazard and significant-hazard dams, 1,123 in Missouri, are currently exempt from inspections. As a result, their physical condition is unknown. Should a high-hazard or significant-hazard dam breach or fail, it will likely result in loss of life or significant property damage. We must reduce this risk by eliminating the exemptions and ensuring that all high-hazard and significant-hazard dams are in a state of good repair with proper emergency action plans.
- 4 Invest in our freight infrastructure system.** Our freight network is only as strong as its weakest link. While Missouri's ports and railroads are well-positioned to move an increased volume of goods, inland waterways and roads are not. We need to execute the strategies and work toward the goals in the Missouri State Freight Plan to ensure that all the components of the freight system are prepared for future growth.

About ASCE-MISSOURI

Civil engineering experts in their respective fields from the ASCE Kansas City Section, with assistance from the St. Louis Section, prepared the Report Card for Missouri's Infrastructure. The Report Card is created to educate and advise our elected officials and voters on the condition of our state's infrastructure using sound engineering evaluation criteria and to provide recommendations on how to raise the grade. Since 1921, the Kansas City Section has represented Civil Engineers in America's engineering hub, and the organization is planning its Centennial Celebration. The St. Louis Section was organized in 1888 and officially became a chapter of ASCE in 1914. St. Louis is the home of several significant civil engineering landmarks. ASCE provides a platform for members to mentor, learn, and teach which enables us to serve as stewards of infrastructure in our state, the United States, and throughout the world.

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REPORT CARD FOR MISSOURI'S INFRASTRUCTURE

2018

G.P.A.



**"Don't wait.
The time will never
be just right."**

-Mark Twain

ASCE
AMERICAN SOCIETY
OF CIVIL ENGINEERS

Infrastructure Matters

Infrastructure supports our way of life. Our roads enable us to get to work, our aviation infrastructure allows us to take vacations, our freight infrastructure brings us our goods, and our drinking water infrastructure lets us lead healthy lives. For many years, we made investments to support these systems. Unfortunately in recent years, there has been a trend of underinvestment in infrastructure that threatens our competitive advantage and the health, safety, and welfare of our citizens. The time to prioritize our transportation and water infrastructure has come.

As civil engineers, our job is to plan, design, construct, and maintain our infrastructure networks. The 2018 Report Card for Missouri's Infrastructure is designed to translate our expertise into a guide to help our fellow citizens understand the state of our infrastructure. The Report Card provides a snapshot for residents and policymakers to engage in conversation about where we are and where we need to be for continued economic success of the state. We hope that this information provides the insight needed to start that conversation and ignite action.

How You Can Get Involved

- 1** Get the full story behind this Report Card at www.infrastructurereportcard.org/missouri.
- 2** Find out the condition of the infrastructure near you on the Save America's Infrastructure app available on iTunes and GooglePlay.
- 3** Ask your elected leaders what they're doing to make sure your infrastructure is reliable for the future. Take action at www.infrastructurereportcard.org/get-involved/tell-your-legislators/.

2018 MISSOURI INFRASTRUCTURE REPORT CARD

The 2018 Report Card for Missouri's Infrastructure gave the state an overall GPA of C-. Missouri's civil engineers studied 11 infrastructure categories. Of those 11, seven infrastructure categories are in mediocre condition, and four categories are in poor condition.

The good news is there are solutions to all these challenges, and we can raise Missouri's infrastructure grades. By learning more today about the conditions of the infrastructure you use every day, you too can help raise the grade.

AVIATION C

Missouri is home to nearly 500 aviation facilities, including Kansas City International Airport (MCI) and St. Louis Lambert International Airport (STL). In 2017, MCI reported over 11.5 million passengers and was ranked the 39th busiest airport by enplanements and STL reported over 14.7 million passengers and was ranked, the 32nd busiest airport by enplanements. MCI's 2009-2025 Airport Master Plan estimated an annual growth rate of 2.8% and shows the existing runway system should be fully capable of meeting demand during this period. STL's airport passenger rate grew 5.5%, airplane operations grew 3.1%, and air cargo grew 2.4% in 2017. Both airports have identified needed projects and are working to secure funds to make them a reality. For example, in 2017 the City of Kansas City, MO, voted to approve private financing for the construction of a modern, single terminal to replace the existing three terminals.

BRIDGES C

Missouri has the seventh largest number of bridges nationwide, yet must maintain its inventory with funding from just the fourth lowest gasoline tax in the country.

Not surprisingly, the condition of the statewide inventory lags somewhat behind the national average. 12.5% of bridges in Missouri are structurally deficient, compared with 8.9% of bridges nationwide. Fortunately, the situation is improving. Over the last 10 years, the Missouri Department of Transportation (MoDOT) has directed available funding to its "Safe and Sound" bridge program, which replaced over 800 bridges from 2009 to 2013. While recent focused efforts by MoDOT and other agencies are helping to maintain the status quo, significant challenges remain ahead due to the inability to identify a funding source that is amenable to Missouri citizens. The state has identified 4,800 bridges that need repairs, totaling an estimated \$4.2 billion.

ENERGY D+

Approximately 79% of the energy in Missouri is produced by coal power plants with another 12% being provided through nuclear energy.

The remainder of Missouri's energy needs are met through natural gas, hydroelectric, solar, and wind generation. Aging infrastructure and government regulation continue to be major drivers of large expenditures for both the power plants and in the distribution system. While the retail price of electricity in Missouri is below the national average for all end-users, over the past 10 years state electricity rates have risen faster than every other state, but four. Additionally, permitting and siting issues continue to threaten planned high-voltage transmission lines as well as oil and gas pipelines.

INLAND WATERWAYS D

The State of Missouri has over 1,050 miles of navigable waterways positioned on the Missouri, and the Upper Mississippi rivers, ranking it 10th in the nation in terms of mileage.

Funding shortfalls to repair and replace locks and dams on the Mississippi River are common, and Congressional appropriations are inconsistent. This causes delays in maintenance dredging, often leads to an increase in unscheduled delays at the locks, and frequently results in costly emergency funds serving as a major source of revenue for needed repairs. In fact, in fiscal year 2016 alone, the USACE allocated \$1.6 million in emergency lock repairs for the St. Louis District. On the Mississippi River, shippers also must contend with five locks with 600-foot chambers. Unlike 1,200-foot chambers, which allow for a 15-barge tow to navigate through efficiently, 600-foot chambers require a barge tow to break up to navigate through the lock, thereby increasing the time and cost to move goods.

LEVEES D+

Over the past five years, levees in Missouri have undergone increased inspection, repair, and capital improvements.

The structures that are being inspected are in fair condition. However, there has been a piecemeal approach to capital improvements, with some levees being raised while neighboring levees are unchanged, resulting in an increased risk of flooding in the neighboring areas. Additionally, coordination between levee districts is lacking, and people and property remain vulnerable to flooding. While the U.S. Army Corps of Engineers and the Missouri State Risk Management Team are raising awareness and developing flood hazard identification maps, funding is insufficient to comprehensively mitigate flood risks. Funding of the National Levee Safety Initiative could help close the gap on levee inspections.

DAMS D-

Missouri's approximately 5,529 dams help the state meet its agricultural, recreational, stormwater management, water supply, and commercial needs. As of July 2017, an estimated 4,624 of dams in the state, or 84% of total structures, were unregulated and their condition not reported to the state. Many of these unregulated structures are small agricultural dams and their failure would be of little consequence. However, due to legislative exemptions, an estimated 1,123 dams in Missouri earning a High Hazard Potential (HHP) or Significant Hazard Potential (SHP) rating are unregulated and their physical condition unknown to the state. A HHP rating indicates that should the dam fail, there is the potential for significant loss of life and property; a SHP rating indicates a potential for significant loss of property. These 1,123 unregulated HHP/SHP dams account for 68% of the total HHP/SHP dams in the state. Because they are unregulated, the condition of these dams is unknown, raising serious safety concerns.

DRINKING WATER C-

Missourians benefit from well-managed and operated private and public water utilities. Unfortunately, these utilities have difficulty securing additional sources of funding and financing due to onerous state requirements that require voter approval to raise new revenue and issue general obligation bonds. As a result, investment in drinking water infrastructure continues to be insufficient, resulting in systems that are plagued with service interruption from main breaks, microbial contamination, and inadequate capacity. The City of Kansas City experienced a record 1,844 main breaks in 2012, and St. Louis is facing similar issues with an average water main age of 55 to 65 years. The Environmental Protection Agency estimated in 2011 that the 20-year Missouri water infrastructure needs were \$8.5 billion. Improved planning, reduced regulatory impediments, and increased funding are vital if Missouri is to maintain present facilities and ensure safe and reliable water supplies for future generations.

PORTS C

The State of Missouri has a good port system with connections to much of the state's expansive freight network. MoDOT recently conducted an economic impact analysis, which showed that nearly four million tons of freight was shipped through the state's public ports in 2016 alone, equating to a 78% increase since 2011. Ports in Missouri have sufficient capacity to accommodate this growth and adequate access to the Interstate Highway System, Class I railroads, and major utility services. However, funding for capital projects and regular operation and maintenance continue to be a challenge. In recent years, funding for ports decreased from \$6 million to \$4 million. Alternative revenue streams, grants from federal programs, and innovative financing should continue to be pursued in order to prepare for the 26.9% increase in waterway freight that is anticipated by 2030.

RAIL C

Given Missouri's location at the center of the country, the state is an important crossroads for goods and people, and the railroad infrastructure that facilitates these movements is vital. Utilization of rail is forecasted to grow; the 2012 Missouri State Rail Plan estimates a more than 30% increase in freight traffic along a majority of the state's rail corridors through 2031. Class I railroads are planning accordingly. From 2016-2017, Union Pacific and Burlington Northern Santa Fe Railroad spent approximately \$49 million and \$140 million respectively on maintenance, increasing operating efficiencies, and safety enhancements. While much of the freight system is privately funded and maintained, the passenger system relies on public funds. Missouri should continue to aggressively pursue all avenues available to implement proposed rail improvements identified in the State Rail Plan.

ROADS D+

Missouri's roughly 34,000-mile highway network, the 7th largest in the country, plays a critical role in the state's economic growth, traveler efficiency, and the quality of life of its citizens. In recent years, MoDOT has been able to fund and deliver roadway pavement maintenance improvements, significantly improving road surface conditions throughout the state's transportation system. However, the state motor fuel tax has not increased since 1996, and Missouri ranks 4th lowest in state gas tax and 47th overall in revenue per mile. Due to inflation and rising construction costs, the 17-cent tax now equates to eight cents in purchasing power. Missouri only spends 43% of the national average on operations and maintenance per state-controlled mile. Without action in the state legislature, funding constraints are anticipated to continue, leaving Missouri's ability to sustainably fund future roadway maintenance and improvement projects in jeopardy. Meanwhile, residents spend \$604 annually per motorist in extra vehicle repairs and operating costs, compared with \$533 per driver nationwide. A long-term revenue stream for transportation must be identified in order to improve Missouri's economic competitiveness and keep residents safe.

STORMWATER/WASTEWATER C-

Wastewater and stormwater systems are made up of four components: collection, conveyance, treatment, and discharge.

Regular investment in, and maintenance of, these systems is critical to protecting public health through prevention of untreated sewer overflows into Missouri's surface waters. The average age of this infrastructure throughout large municipalities and small towns in Missouri is approaching the end of its expected life, resulting in increased frequency of leaks and failures within sewer systems. Fortunately, many municipalities are innovating and investing. The Metropolitan Sewer District of St. Louis is currently working to implement \$4.7 billion in improvements over 23 years. In Kansas City, improvements totaling \$2.5 billion will be completed over 25 years and the city is leading the nation in green infrastructure innovations. However, more is needed; a 2012 assessment by the Missouri Department of Natural Resources (MDNR) and the Environmental Protection Agency (EPA) estimated that \$9.6 billion would be needed to address Missouri's wastewater and stormwater infrastructure needs over the next 30 years.