## MICHIGAN GRADES



### **SOLUTIONS TO RAISE THE GRADE**

If Michigan is ready to improve our infrastructure, ASCE-MI has some suggestions to start raising the grade:

#### SUPPORT INNOVATIVE POLICIES:

In addition to continuing to lead in the autonomous vehicle and freight movement spaces, Michigan must enact policies that facilitate highquality data gathering and put asset management practices into place. We support the proposed creation of the Michigan Infrastructure Council, which will lead to greater insights into the condition of the state's infrastructure and the maintenance challenges we face.

#### **INCREASE STATE FUNDING:**

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The Michigan legislature took the first steps to increasing investment in our transportation network in 2015. To build on this action, the legislature must appropriate transportation funds in years 2019 to 2021, as promised. Additionally, we support ongoing efforts to redesign the Clean Water State Revolving Fund and Drinking Water Revolving Fund, both of which provide financial support to water systems through federal-state partnerships.

#### **PRIORITIZE PUBLIC HEALTH AND SAFETY:**

"Safety First" must be the approach to all of Michigan's infrastructure decisions. Integrated asset management is the critical first step in developing a foundation for safe and reliable infrastructure in Michigan. Safety can further be improved by properly maintaining Michigan's infrastructure. Proactive investment in infrastructure yields savings down the line and ensures the health and welfare of Michiganders.

#### **BE INFORMED, BE VOCAL:**

ASCE's Michigan Section encourages you to learn more about your community's infrastructure needs. Attend town halls or legislative events and get to know your elected officials. Use the Report Card for Michigan's Infrastructure to effectively inform lawmakers and the public about where to direct limited resources and how to improve Michigan's infrastructure.

## 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:





Exceptional, Fit for the Future



for Now

Mediocre.

**Requires** 

Attention





Poor. At Risk

Failing/Critical, **Unfit for Purpose** 

# About ASCE-MICHIGAN

Established in 1916, the ASCE Michigan Section is one of the largest and most active Sections maintaining over 2,200 members. There are five active Branches in Michigan including the Northwest, Western, Southwest, Lansing/Jackson, and Southeast. Civil Engineers in Michigan join ASCE to develop leadership skills, enhance their knowledge of the latest technology and engineering practices, and to network with other civil engineering professionals. The ASCE Michigan Section promotes the profession by offering annual scholarships to deserving students pursuing a career in Civil Engineering. The Section also co-hosts an annual Michigan Infrastructure Conference to advance the knowledge of its members and to honor outstanding individuals and projects. ASCE Members advocate for infrastructure and environmental stewardship which will lead to a better quality of life for all Michiganders.

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## Infrastructure Matters

Infrastructure includes fundamental facilities and systems necessary for Michigan's economy to function. Roads, bridges, schools, water and sewer systems, dams, railways, and energy systems are categories of infrastructure that directly affect our ability to live, work and play.

Quality infrastructure allows Michigan to be a frontrunner in research & development, manufacturing, farming, and tourism. Our transportation system gets people to work every day or up north for weekends. Water systems deliver clean drinking water to our homes, communities, and businesses. School buildings provide a safe place for our children to learn. Stormwater and wastewater treatment systems protect our neighborhoods from floods, and our lakes, rivers, and beaches from contamination.

Today, Michigan's infrastructure is old and outdated. Michigan's economic downturn resulted in underinvestment in maintenance and repairs. We're now faced with pothole-ridden roads, bridges propped with temporary supports, sinkholes destroying homes and closed beaches.

The 21st Century Infrastructure Commission determined an additional \$4 billion annually is needed to maintain our infrastructure. Michigan must support innovative policies leading to cleaner water, smoother highways, and a safe environment that will attract business and improve our quality of life.

The 2018 ASCE Michigan Report Card is a simple tool used to help residents, businesses, and policymakers understand the state of Michigan's infrastructure. This information helps start the conversation about how to improve our poor infrastructure.

#### How You Can Get Involved



Get the full story behind this Report Card at www.infrastructurereportcard.org/michigan.

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Find out the condition of the infrastructure near you on the Save America's Infrastructure app available on iTunes and GooglePlay.



Ask your elected leaders what they're doing to make sure your infrastructure is reliable for the future. Use your zip code to find your list of elected officials at www.infrastructurereportcard.org/take-action.

# REPORT CARD

The 2018 Report Card on Michigan's Infrastructure gave the state an overall GPA of D+. Michigan's civil engineers studied 13 infrastructure categories. Of those 13, nine infrastructure categories are in mediocre condition and four are in poor condition.

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



Michigan's 234 airports, including 18 commercial airports, contribute more than \$22 billion annually to the state's economy. Scheduled airlines transported more than 39 million passengers to and from Michigan airports in 2016, and the Detroit Metropolitan Airport was ranked 18th nationwide in total passengers for 2016. Beginning in 2008, as a result of the economic downturn, Michigan's aviation industry saw a significant decrease in aircraft operations. However, projections show a steady increase in general aviation activity and substantial growth for corporate and commercial activity over the next 15 years. Despite these projections, funding and programs have remained unchanged since 2005. The bulk of capital funding improvements to the aviation system are provided with federal Airport Improvement Program funding through the Federal Aviation Administration. This funding program was most recently reauthorized by Congress under the Federal Aviation Administration Modernization and Reform Act of 2012, which has been extended until March 31, 2018. While Fiscal Year (FY) 2018 will probably be funded by continuing resolutions, a new authorization should be developed in 2018.



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Michigan's over 11,000 bridges are critical connections in our surface transportation system, providing crossings over waterways, roads and railroads. A deteriorating and inadequate highway transportation system costs Michigan motorists billions of dollars every year in wasted time and fuel, injuries and fatalities caused by traffic crashes, and wear and tear on their vehicles. Fortunately, the Michigan legislature took the first steps to increasing investment in our transportation network in 2015. The 2015 infrastructurefunding package relies on a combination of increased user fees, registration fees and general funds. To build on the results of increased funding, the legislature must continue to appropriate the funds each year. However, these funds are not sufficient to address the significant deterioration of the system. Approximately 1,234 bridges (11%) of the state's 11,156 bridges are structurally deficient, and the Michigan Department of Transportation anticipates, based on available funding, the number of state maintained bridges currently rated in poor condition will increase by 50% between 2016 and 2023, from 236 bridges to 354 bridges.



Michigan's approximately 2,600 dams support water supply, irrigation, hydropower, and in some cases, recreation. There are 140 high hazard potential dams in the state. Hazard potential is not an indication of the dam's condition, but an indication for the potential for loss of life and property damage if the dam were to fail. According to condition assessment data in the National Inventory of Dams, the state's high hazard dams have an average rating of "fair," scoring about 79 on a 100-point scale. While some improvement in the overall condition of Michigan dams has been made in recent years, mostly through the removal of dams, the state must make more progress, particularly as dams across the state continue to age. According to the 21st Century Infrastructure Commission Report, \$225 million is needed in additional state funding over the next 20 years to manage our aging dams in Michigan.

# DRINKING WATER

Michigan is nearly surrounded by the Great Lakes, which contain 21% of the world's fresh water, and is served by multiple subsurface aquifers. Yet certain drinking water system "owners" (e.g., municipalities) face scarcity concerns, contamination, and aging treatment/distribution systems that are not aligned with drinking water user needs. According to Public Sector Consultants and 21st Century Infrastructure Commission reports, failure to adequately plan for and fund drinking water infrastructure could lead to major crises affecting millions of the State's residents. It is estimated that system owners in Michigan are underfunding system improvements for Safe Drinking Water Act compliance at between \$284 to \$563 million every year.

# ENERGY



Michigan's energy systems generally meet current needs. The status is threatened by increasing energy dependence and demand for high service reliability coupled with aging infrastructure, lack of investment to preserve function, exposure to physical and cyber threats, congestion, and dependence on externally sourced fossil and nuclear fuels. Diversification of the energy supply by expanding renewable energy, using electric transmission and distribution systems, upgrading energy pipelines, and increasing resiliency are recommended to meet future needs, avoid energy disruptions, and lower the risk of future increased energy costs.



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Michigan's navigation system includes coastal infrastructure, navigation harbors, channels, locks, and dams. The system contains approximately 50 harbors, 14 navigable waterways, the Soo Locks system, and numerous disposal facilities for depositing dredged material. The U.S. Army Corps of Engineers is provided a limited amount of federal money each year to cover all maintenance and operations requirements including dredging, breakwater, confined disposal facility, etc.; however, these annual funds have not kept pace with system needs, resulting in funding needs gaps that grow each year. The Soo Locks facility passes 80 million tons of commercial commodities annually. Construction of a redundant lock at this location is critical to sustaining the shipping industry. Likewise, maintenance activities must be provided for the current lock system to remain functional. A 2015 Department of Homeland Security study stated that a 30-day unscheduled closure of the Soo Locks would cost industry \$160 million and a breakdown lasting six months would cripple the United States economy with 11 million jobs lost. Conversely, a new study commissioned by the U.S. Treasury Department stated that a second lock at this location will provide system resiliency that has an estimated economic benefit of \$1.7 billion.





Michigan's rail system has approximately 3,600 miles of track that are operated by 26 private railroad companies. With the exception of 665 miles owned by the Michigan Department of Transportation (MDOT) and operated under contract, the infrastructure is privately owned. As Michigan is a peninsula state, there are three international border crossings by rail to Canada, one of the United States' and Michigan's largest trading partner. About 20 percent of the total freight moves in Michigan are made via rail. The rail system moves over \$194 billion in commodities, the largest of which include coal, transportation equipment, and agricultural products. Approximately 33 million tons move into the state and 22 million tons move out of the state by rail. Freight rail movements are projected to increase 49.8%, to 148 million tons, by 2030. Public dollars fund public at-grade crossing improvements and some very limited capital improvements. The needs associated with the limited state programs outpace the public dollars available.

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Based on a 2016 assessment, 39% of Michigan's 120,000 miles of paved roadways are rated in poor condition, 43% are rated in fair condition, and just 18% are rated in good condition. Nine years after a significant economic downturn, Michigan is recovering with its population and economy growing again, and vehicle travel is increasing in response to the growth. However, the rate of recovery may decrease if Michigan is not able to provide roads that are in good condition. In 2015, Michigan's governor signed into law a road-funding package that relies on a combination of increased user fees, registration fees and general funds. These funds will assist state and local governments in moving forward with numerous transportation projects but is not sufficient to address the significant deterioration of the system.





The condition of Michigan's education facilities varies widely both across the state, and within individual regions and districts. Nearly every district or organization has aging facilities, while some also have a mix of updated and newly constructed facilities. Access to funding for school facility improvements is largely based on the size of the local property tax base. The condition of Michigan's K through 12 schools varies based on a region's propensity to support property taxes for schools, and the value of the region's taxable property. Overall, Michigan's schools have stabilized and shown slight improvements in enrollment numbers and facility funding. These improvements are driven by the improving economic conditions in Michigan and higher birthrates. As this trend continues, it is anticipated there will be less consolidation and closing of aging school facilities, and a movement will begin towards renovation, expansion, and construction to meet the future needs of Michigan's student population.





Solid waste disposed in Michigan totaled nearly 16 million tons in 2016, similar to the previous year. The estimated residential recycling rate was 15%, less than half the US average. Daily per capita waste generation is approximately 5.6 pounds, nearly 27% greater than the national average of 4.4 pounds. Overall, Michigan's collection, transfer and disposal infrastructure is robust and the industry competitive, with approximately 27 years of landfill disposal capacity remaining. Michigan is beginning to actively shift its overall solid waste philosophy toward a sustainable materials management approach to create economic opportunities through waste diversion, beneficial re-use, and recycling programs.







Michigan's stormwater management system provides flood protection, improves the quality of life for residents, allows our businesses to operate safely and efficiently, provides for safe transportation, improves agricultural production, and extends the service life of roads, streets, and highways. Stormwater management impacts the water quality of streams, rivers and the Great Lakes, which are a key component of Michigan's economy. Currently, Michigan lacks a systematic approach to inventorying, operating and maintaining our stormwater infrastructure, and few communities have dedicated funding sources for stormwater systems. Recent implementation of asset management programs are exposing the deterioration of our stormwater infrastructure, and unless a funding source is dedicated, Michigan's stormwater infrastructure will continue to decline.



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The 78 public transit agencies in Michigan provide 88.4 million passenger trips annually. While a majority of Michigan's residents have access to some form of public transportation, the reliability and availability of these services to many areas is inadequate, and some of the urban systems are unable to adequately meet transit demands. Existing fleets are aging, and some are already past useful life. Fortunately, the state and localities are making strides in addressing transit gaps and are investing in the existing infrastructure. In 2012, Detroit and the surrounding counties established the Regional Transit Authority (RTA) of Southeast Michigan, which oversees new bus routes, and improves transit safety, viability, and reliability. Since establishment of the RTA of Southeast Michigan, ridership in the region has increased. The state will continue to experience significant challenges and opportunities as millennials and seniors, who view transit as the preferred mode of transportation, make housing choices in urban areas.





Michigan is surrounded by four of the five Great Lakes, and the state's 3,288 miles of shoreline are fed by 11,000 inland lakes, 51,000 miles of river systems and 6,500,000 acres of wetlands. It is essential that these valuable assets are protected, and our \$15 billion water economy is sustained by proper operation, maintenance, and rehabilitation of our wastewater infrastructure. Michigan has been making great strides in asset management with assistance from the Department of Environmental Quality's Stormwater, Asset Management, and Wastewater grant funding, but should allocate additional funding for secondary treatment and conveyance system repairs, according to the 2012 EPA Clean Water Needs Survey. The EPA estimates \$690 million is needed for Michigan's secondary treatment, and \$702 million is needed for conveyance system repair and improvement needs.

#### INFRASTRUCTUREREPORTCARD.ORG/ MICHIGAN