MICHIGAN GRADES

Aviation	C
Bridges	D+
Dams	C-
Drinking Water	D+
Energy	D
Inland Waterways	C
Public Parks	C
Rail	C
Roads	D
Schools	C-
Solid Waste	C+
Stormwater	D
Transit	C-
Wastewater	C
GPA	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
- **B** – Good, Adequate for Now
- **C** – Mediocre, Requires Attention
- **D** – Poor, At Risk
- **F** – Failing/Critical, Unfit for Purpose

SOLUTIONS TO RAISE THE GRADE

1 ENHANCE AND EXPAND DEDICATED FUNDING FOR INFRASTRUCTURE AT STATE AND LOCAL LEVEL

In the last five years, the condition of Michigan roads have improved, airports have held steady or sought new capacity, schools have increased facility spending, and water systems have started chiseling away their project queues. These infrastructure systems cannot sustain progress or seriously reduce investment gaps without greater predictable funding.

2 PROACTIVELY ADDRESS WORKFORCE DEVELOPMENT CHALLENGES

The infrastructure workforce makes improvement possible, and most employers are now struggling to hire and retain staff. Government leaders, the private sector, and educational institutions should coordinate efforts so Michigan can maximize the positive benefits of recent federal and state investment.

3 FOCUS PLANNING AND DESIGN ON RESILIENCE AND RELIABILITY

Michigan's energy grid was unreliable in recent storm events and stormwater infrastructure is not sufficient to endure increasingly unpredictable and high-magnitude threats. Decision-makers should advance upgrades to infrastructure systems to help them stay operational during adverse events, using redundancy, updated codes and standards, and other strategies.

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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2023 REPORT CARD FOR MICHIGAN'S INFRASTRUCTURE

ASCE AMERICAN SOCIETY OF CIVIL ENGINEERS MICHIGAN SECTION

Infrastructure Is Important

Quality infrastructure is necessary for Michigan's economic success, public health, and social prosperity. Our transportation system allows Michiganders to take essential and recreational trips. Water systems deliver drinking water to homes and offices, collect and treat wastewater from growing communities, and convey stormwater from dangerous flooding. Ports and inland waterways provide routes from farm to market. And the state – home to Edison's private residence, the first in America to utilize electricity – relies heavily on the power grid to charge electronics and keep the lights on.

For too long, Michigan's infrastructure suffered the impacts of chronic underinvestment. Fortunately, progress has been made over the past five years thanks to investments from the state and federal lawmakers. These included $3.5 billion in bond funding from the "Rebuilding Michigan Program" and $4.7 billion from the "Building Michigan Together" plan. Michigan is also set to to receive $11 billion over the next five years from the 2021 Bipartisan Infrastructure Law for much needed projects in the systems assessed by this report card.

To sustain recent improvements to Michigan's infrastructure, close investment gaps, and expand system services, decisionmakers must implement sustainable, dedicated, long-term funding solutions, address workforce challenges, and prioritize resilience and reliability. The 2023 Report Card for Michigan's Infrastructure can help residents, elected officials, and decisionmakers easily understand the state of our infrastructure and how to make strategic decisions to continue the forward progress.

How You Can Get Involved

1. **Get the full story behind this Report Card at www.infrastructurereportcard.org/Michigan.**
2. **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.**

2023 MICHIGAN'S INFRASTRUCTURE REPORT CARD

The 2023 Report Card for Michigan's Infrastructure gave the state an overall GPA of a C-. Michigan's civil engineers studied 14 categories of infrastructure. Of those 14, nine are in mediocre condition, and five are in poor condition, and one has yet to be graded.

The good news is that there are solutions to all of 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.

AVIATION

C

Michigan's 234 airports, including 15 primary airports, contribute over $23 billion annually to the state's economy. Scheduled airlines transported more than 42 million passengers to and from Michigan in 2019. The Michigan Department of Transportation maintains the condition and overall safety of aeronautical infrastructure through asset management. The average Pavement Condition Index (PCI) of airports in the state increased slightly from a PCI of 69 out of 100 in 2018 to a PCI of 71 in 2020. While federal funding for Michigan's airport infrastructure has increased slightly over the past four years thanks to the Bipartisan Infrastructure Law and COVID-era relief legislation, state funding is uncertain and limited. The three cents-per-gallon Aviation Fuel Excise Tax has been unchanged since its inception in 1931 and the $6 million revenue from the Airport Parking Tax is increasingly reserved for bond repayment obligations.

BRIDGES

D+

Michigan had 11,314 bridges in 2022, providing crossings over waterways, roads, railroads, and severe topography. Approximately 1,269 (11%) of those bridges are in poor condition, stable from 11% in 2018, but higher than the 7.5% national average. They include heavily traveled structures like I-696's overpass and ramps with I-75. Good condition bridges dropped to 35% of the total in 2022 from 40% in 2018, increasing fair condition bridges to 54% from 50%. An additional $380 million to $510 million is needed annually to repair Michigan's bridges, with long-term savings for higher near-term funding. One-time investments from Lansing have prevented even worse bridge degradation the last few years, and the federal Bipartisan Infrastructure Law has already sent some of the $563 million expected for Michigan bridge work through 2026. Michigan's gas tax, indexed for inflation from January 2022, will further fund improvements, but the bridge backlog remains larger than Michigan's last report card.

DAMS

C-

Dams in Michigan support flood control, economic development, and recreation. Approximately 75% of the state's 2,600 dams are privately owned, with others owned by municipalities, public utilities, the state, or federal government. Six percent of dams in Michigan have "significant" hazard potential, meaning should they fail, loss of life and economic damage is likely. Of these 149 dams, four are in unsatisfactory condition and five are unrated. Michigan's dam safety program budget was increased after dam failures at Edenville and Sanford in 2020. But new resources are needed to improve the overall condition of dams across the state. The Michigan 21st Century Infrastructure Commission Report cited a need for $225 million over the next 20 years to manage aging dams.

DRINKING WATER

D+

Most of the infrastructure within the State of Michigan's community water supply systems (CWS) is over 50 years old and a significant portion is approaching 100 years of service life. The state has a $860 million to $1.1 billion annual gap in water infrastructure needs compiled from decades of deferred maintenance and lack of knowledge on asset conditions. The Flint water crisis placed a national spotlight on the impacts of deteriorating infrastructure, fragmented decision-making, and severe underinvestment in water infrastructure. Flint is not alone. Many other Michigan CWS need critical infrastructure improvements. Drinking water upgrades have jump-started thanks to regulatory advancements on lead and copper, requirements for asset management planning, and recent influxes of funding for projects including replacement of over 27,000 lead service lines. Long-term, sustainable funding sources are needed to drive continued success.

ENERGY

D

Electricity in Michigan is delivered by 7 investor-owned utilities, 11 cooperative utilities, and 40 municipally owned utilities – the first of which have rates overseen by Michigan's Public Service Commission (MPSC) and serve the most customers. Investor-owned DTE Electric Company distributes power to most of the state's thumb, with fellow private Consumers Energy servicing the rest of the Lower Peninsula. In 2020, utilities in Michigan were 37% higher than the national average in time to restore non-momentary electric interruptions. High outages were reported in 2021 and 2023 with a small 2022 dip, principally due to storms. Michiganders pay $0.18/KWh in residential use, compared to a $0.155/KWh national average, and $0.133/KWh in commercial use versus $0.128/KWh nationally. Adding clean energy sources while maintaining high service reliability is difficult with aging transmission lines and last-mile connections. Infrastructure improvements should focus on resilience and rates should account for life-cycle costs while keeping energy affordable to stakeholders.

INLAND WATERWAYS

C

Michigan's inland waterway navigation system includes 50 federal harbors, 14 navigable waterways, the Soo Locks system, and dredged material facilities for material placement. Over 90% of Great Lakes coastal structures are older than 60 years, exceeding the typical 50-year design life and increasing costs to maintain operations. Funding for navigation has steadily increased over the past decade with supplemental funding from the 2021 Bipartisan Infrastructure Law and 2023 Disaster Relief Supplemental Appropriations Act providing $73.1 million for federal navigation projects in Michigan. Construction to improve redundancy at the Soo Locks is underway on a second Poe-sized lock, preventing multi-million-dollar industry losses and nation-wide job destruction for each day of unscheduled closure. High water across all the Great Lakes has challenged Michigan's navigation system recently, coupled with increased high wave activity, contributing to significant shoreline erosion and accelerated deterioration of aging navigation structures.

PUBLIC PARKS

C

Michigan offers 3,300 miles of freshwater coastline on four of the five Great Lakes, over 11,000 inland lakes, and 8.2 million acres of public land. Parks in the state experienced 169% higher usage since 2020. An estimated 83% of Detroit residents and 78% of Grand Rapids residents live within a 10-minute walk of a city park, compared to the national average of 55%. In 2021, the State allocated $97 million to state parks, helping to address deferred maintenance. Additionally, Governor Gretchen Whitmer directed $250 million of American Rescue Plan Act dollars to the state park system, plus $150 million more to local parks. Implementing park elements of 2022's Building Michigan Together Plan and closing the estimated $330 million in backlogged infrastructure improvements requires dedicated, predictable, long-term funding methods that account for life-cycle costs, workforce challenges, and increased resilience needs.

RAIL

C

Michigan's rail system has approximately 4,000 miles of track, 84% of which is owned and operated by 27 private railroad companies, with the remainder owned by the Michigan Department of Transportation (MDOT). 17% of freight moving in Michigan uses rail, transporting $194 billion annually in agricultural products, chemicals, large equipment, and other commodities. Three passenger rail services operate between Chicago and Michigan's cities, but the state is disconnected from high-ridership routes that connect Boston, New York, and Washington. . Passage of the 2021 Bipartisan Infrastructure Law directed new funds, leveraged by state and private investment, for safety and service upgrades.

ROADS

D

Traffic volumes have returned from pandemic-era lows. Vehicle miles traveled in 2021 were 97 billion, 95% of the 2019 number. Fortunately, the condition of roads Michiganders are driving on are improving, thanks in part to a 2017 funding package. Of Michigan's 120,000 miles of paved federal-aid-eligible roads, 25% are in good condition, up from 20% good in 2017. 42% of the roads are rated as fair, and 33% are in poor condition. Governor Whitmer's 2020 "Rebuilding Michigan Program" included $3.5 billion of one-time bond financing, accelerating major highway projects on state trunklines. To erase decades of underinvestment and meet future needs, decision-makers should increase dedicated funding for roads, re-tool fee models, prioritize traffic safety, and improve resilience to worsening environmental threats.

SCHOOLS

C-

Michigan's educational facilities serve a critical role as community cornerstones. These institutions have made progress in rightsizing for leveling off enrollment and infrastructure investment shows positive trends. The state spent almost $2 billion on school capital expenditures during the 2020-21 school year, up from $1.7 billion and $1.4 billion in the previous two years. Per pupil facility spending in Michigan now roughly equals the national average of $1,376 per pupil. But much of recent investment comes from one-time increases expiring in 2024. Decisionmakers should direct predictable, dedicated infrastructure spending to schools, especially because the state is home to buildings constructed prior to 1970 – 50+ years ago – with some much older. Select systems at school facilities have seen upgrades to preserve functionality, but layouts often don't reflect the teaching needs of 21st century learners.

SOLID WASTE

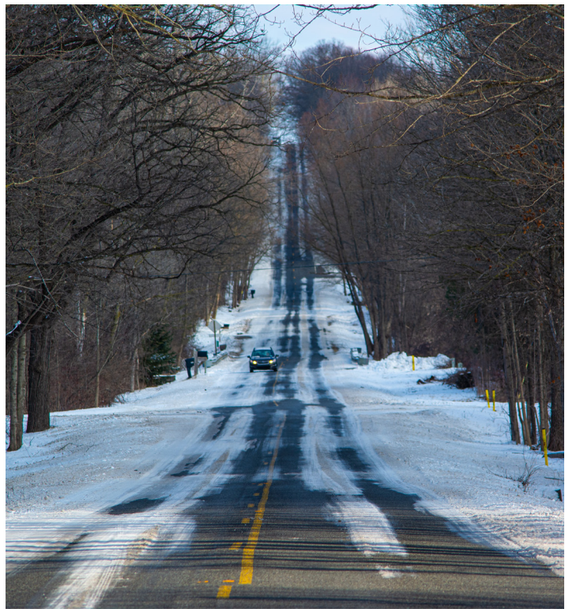
C+

Municipal solid waste (MSW) disposed of in Michigan totaled approximately 17 million tons in 2021, a slight decline from previous years. Daily per capita waste generation is approximately 7.32 pounds, nearly double the national average. Michigan's solid waste disposal infrastructure remains industry competitive, with approximately 26 years of landfill disposal capacity remaining. Michigan's estimated residential recycling rate was 19% in 2021, up from 14% in 2016. While this is encouraging, the recycling rate is still much lower than the national average of 32%. Michigan is aiming for 30% recycling by 2030 and, since 2019, the number of households with available curbside recycling and drop-off sites has nearly doubled. To accomplish those goals and sustain recent progress, Michigan should expand the prevalence of residential and commercial recycling and composting at the curbside, paired with market incentives to minimize, divert, or reuse plastics.

STORMWATER

D

Stormwater management systems in Michigan provide flood protection, impact water quality, improve agricultural production, and extend the service life of roads. Stormwater threats from intense weather are growing. Total annual precipitation has increased by approximately 14% in the Great Lakes Region since 1900, but the amount of precipitation falling in the heaviest 1% of storms has increased by 35% since 1951. There have been 7 federal disaster declarations in Michigan related to severe storms and dam breaks in the past 10 years. Both public and private storm sewer systems do not have the capacity to safely convey water from those extreme water events. Recent implementation of asset management programs identifies greater needs and regulatory constraints. County road commissions own 75% of Michigan roadways for example, but funding for their drainage systems is capped by the State Drain Code at only half of necessary stormwater investment needed.



TRANSIT

C-

In 2021, Michiganders took 32.6 million trips across 88 public transit systems in all 83 counties. The reliability and availability of transit services in many areas is inadequate to meet demand or attract new riders. Existing fleets and facilities are aging. The ability to invest in vehicle procurement, facilities upkeep, and larger capital improvements is constrained due to lack of funding. Over the next 25 years, public transit in Michigan needs $17.3 billion in investment. Of this total, approximately $5.9 billion is unmet needs under current revenue forecasts. The state is also experiencing a shortage of qualified bus operators and mechanics to operate and maintain transit fleets, which constrains service and limits growth potential. Greater funding from predictable, dedicated sources – state and local funds to match increased federal dollars – is necessary for Michigan to improve and expand transit services.

WASTEWATER

C

It is essential to protect Michigan's $15 billion water economy with proper operation, management, and rehabilitation of our wastewater infrastructure. The Michigan Department of Environment, Great Lakes and Energy (EGLE) estimates over $18 billion is needed in the next 20 years to improve the state's treatment/conveyance systems. The State has made strides in these systems, forming in 2013 the Stormwater, Asset Management and Wastewater grant program, in 2018 the the Michigan Water Asset Management Council, and in 2020 the MI Clean Water Plan, and use of funds from federal legislation. Centralized wastewater systems connect to two-thirds of Michigan's four million households; the remaining 1.3 million households are connected to septic systems. EGLE estimates 10% to 25% of these systems are at the end of their useful life or have failed. Sustaining wastewater progress requires more comprehensive asset management, evaluation of capacity concerns, proactive workforce development programs, and dependable funding to reduce the project backlog despite inflation.

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