

# Michigan Department of Transportation (MDOT) Freight Plan Amendment

## BACKGROUND

The Michigan Department of Transportation (MDOT) completed its Freight Plan update on Nov. 4, 2021, in association with the Michigan Mobility 2045 (MM2045) plan. MM2045 fully encompassed the federal requirements for a Statewide Transportation Plan, a State Freight Plan and a State Rail Plan into one multimodal integrated document. The plan satisfied the state freight plan requirements in the Fixing America's Surface Transportation (FAST) Act and was approved by the Federal Highway Administration (FHWA) on March 8, 2022.

MDOT has developed this plan amendment to fulfill the new freight requirements contained in the Infrastructure Investment and Jobs Act (IIJA), passed on November 2021. The material in this document includes IIJA requirements not already contained in MM2045 or provides supplemental information to further address the subject areas. All required freight elements can be located using the enclosed federal requirements matrix (Attachment B).

## COMMERCIAL MOTOR VEHICLE PARKING FACILITIES ASSESSMENT

Truck parking is a nationwide issue and critical to the safety and mobility of truck movements in Michigan. Truck drivers need parking availability to get the rest they need, as required by federal regulations. Drivers can waste hours driving around searching for parking, and the costs can be enormous. Truck parking is also important as drivers wait for pick-up and delivery appointments or to avoid congestion. Inadequate truck parking leads to economic and social costs for truck drivers and the public. In the latest 2023 ATRI Top Industry Issues report, the lack of available truck parking achieved its highest rank to date, coming in second.

MDOT has created a database of all public and private truck parking facilities in the state. The list of facilities has been geocoded to provide GIS analysis of these locations in relation to the volume of truck traffic throughout the state. This gives the department knowledge of truck parking capacity and the areas with gaps in coverage. In Michigan, there are currently 1,597 public truck parking spaces and 6,624 private spaces. Public facilities include rest areas and Welcome Centers, most of which are only available in one direction, while the private facilities are truck stops and truck travel centers. The following maps depict the public and private facilities for the whole state and for the southern Lower Peninsula.

Figure 1. Statewide Map of Truck Parking Facilities

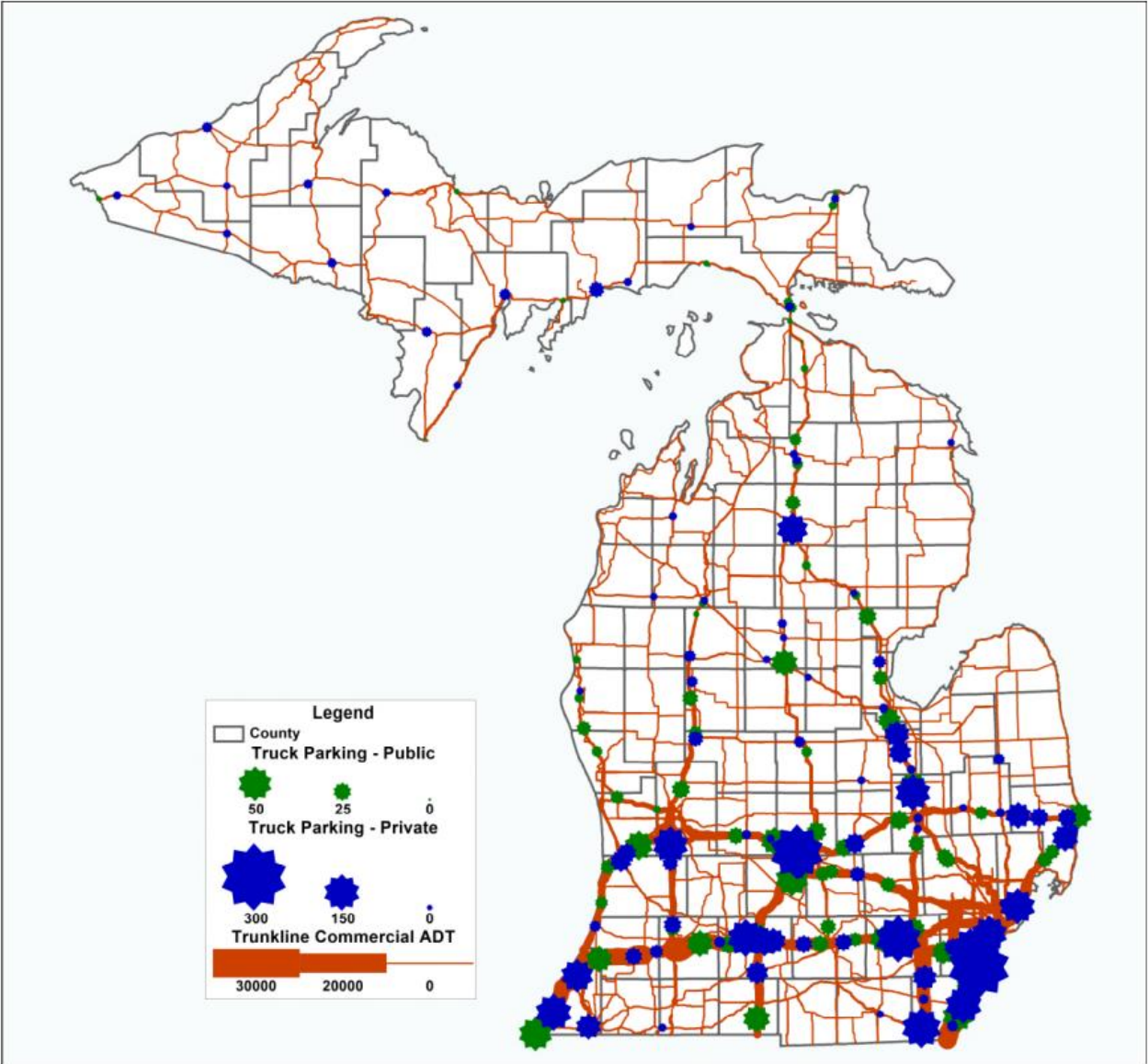


Image caption: A map depicting public and private facilities in the state.



each. Locations along I-75, I-94, I-69, and I-275, as well as near a couple large distribution centers comprised the list. The major issue of overnight parking at rest areas that spill out on to the entry and exit ramps was a consistent concern. Capacity of some of the rest areas is lacking, and this leads to an unsafe, and at times illegal, parking environment.

Currently MDOT does not have plans to increase truck parking at rest areas and Welcome Centers. The department is working to maintain the existing infrastructure. In recent years, a few rest areas have been discontinued; however, in one case the location was left available for truck parking. This former rest area near Tekonsha on I-69 was closed and the facilities were removed, but the site remained open for trucks to park and rest. There is currently a review and analysis of a closed facility on I-94 near Coloma that could provide a similar solution. Safety and continued maintenance are obstacles to these conversions, but this is something the department is working on to address truck parking problems. As the department has available funds to invest in older facilities, design considerations are being made to better accommodate truck movements. An example is the current reconstruction of the Five Lakes Rest Area in Lapeer County, where trucks previously reported challenges maneuvering around the narrow lanes and parking spots.



*Image caption: Image showing reconstruction of the Five Lakes Rest Area in Lapeer County in September 2023.*

A private sector solution has arisen recently where major truck freight generators are building staging areas for their deliveries that are adjacent to the warehouse or plant. The Ford plant in Dearborn has long had a staging area next to the freeway and the plant. Meijer has a similar

setup near their warehouse in Newport off I-75, and Ice Mountain Water is building a staging area next to their plant in Stanwood near US-131. Such locations improve safety and reduce costs as the trucks are not losing time looking for parking several miles away in congested overnight facilities. Another alleviating solution could be the use of weigh stations for overnight parking. These facilities are much like the closed rest areas in that they are only flat lots and have no other amenities or facilities. Coordination with MSP is necessary on potentially using these weigh stations in the future.

In 2014, Michigan was at the forefront of implementing the Truck Parking Information Management System (TPIMS) that other states followed. TPIMS is a system that assesses truck parking and delivers real-time parking availability information to truck drivers. The system began with nine sites along I-94 in 2014 and has since added facilities to total 17 public and private locations on I-94, and one public site each on I-75, I-275, and US-23. TPIMS is an enormous benefit to drivers, especially those with limited service hours remaining, and improves safety while decreasing truck operating costs. MDOT continues to review possible locations for future expansion.

## CONSIDERATIONS OF MILITARY FREIGHT

Michigan is home to two key military installations: Camp Grayling Army National Guard in Grayling and Selfridge Air National Guard Base in Harrison Township. Moreover, the Michigan Army National Guard has a presence in 32 of Michigan's 83 counties. In addition to serving a critical role for Michigan's businesses and industries, the freight system also serves a broader role to support military goods and people movements, as key portions of the highway and rail systems are designated by the U.S. Department of Defense (DoD) as essential to the national defense. These designated corridors, including the bridges on the routes, meet required design standards and weight limits for ease of movement between key ports, airports, military installations, and other locations important for quick response and recovery.



*Image caption: An image from an Air Force and Michigan Air National Guard holding joint exercise on Aug. 5, 2021, testing their capability to land military aircraft on a public roadway on M-32 west of Alpena. The exercise included landing and takeoff of six aircraft: four A-10s and two C-146s.*

Figure 2 shows the STRAHNET (Strategic Highway Corridor Network) and STRACNET (Strategic Rail Corridor Network) corridors in Michigan. The national STRAHNET consists of nearly 63,000 miles of roads deemed necessary for emergency mobilization and peacetime movement of heavy armor, fuel, ammunition, repair parts, food, and other commodities to support U.S. military operations. While DoD primarily deploys heavy equipment by rail, highways serve a critical role. The national STRACNET consists of 38,800 miles of rail track that link 193 military installations to maritime ports of embarkation. The STRACNET main and connector lines must meet defense readiness requirements regarding maintenance condition, clearance, and gross weight. The National Defense Program coordinates the railroad operations with DoD's deployment and peacetime needs.

Figure 3. Michigan Strategic Defense Corridor Map

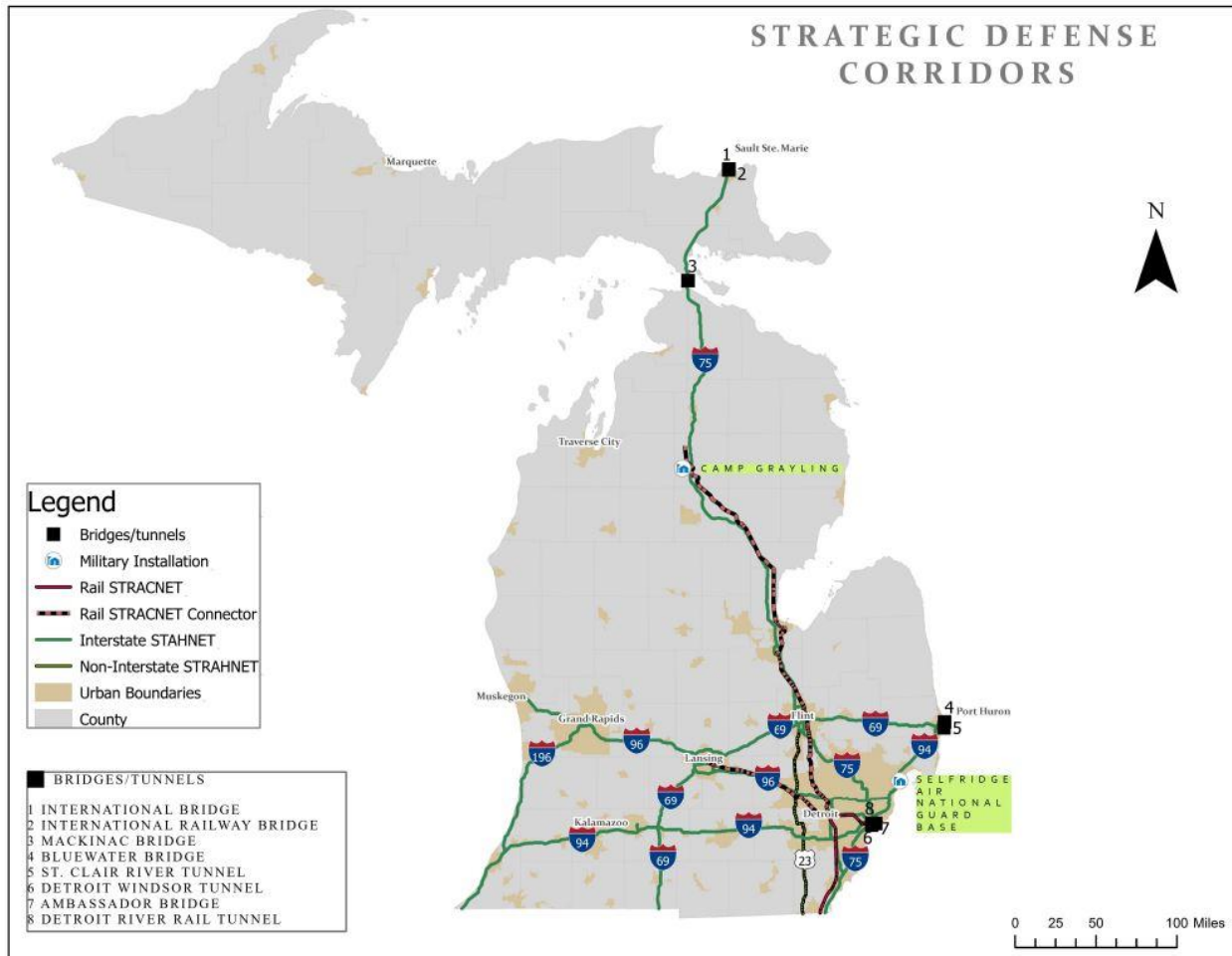


Image caption: A map that shows the major military installations in Michigan with an overlay of the Strategic Highway Corridor and Strategic Rail Corridor Networks.

## STRATEGIES AND GOALS TO DECREASE ENVIRONMENTAL IMPACTS

### Impacts of Extreme Weather and Natural Disasters on Freight Mobility

Recent research utilizing Federal Emergency Management Agency (FEMA) weather data and National Oceanic and Atmospheric Administration (NOAA) Great Lakes data underscores risks of severe weather and changing climate conditions. Data from FEMA reveals that Michigan is particularly susceptible to frequent occurrences of high snowfalls, dangerous ice storms, and heavy rainfall, especially in its most populated and industrial southern regions. Additionally, historic data from NOAA demonstrates the dynamic and rising surface levels of the Great Lakes. Michigan has experienced several related events that have exposed vulnerabilities to its infrastructure, including snow and ice storms resulting in dangerous vehicle pileups, heavy rainfall precipitating widespread flooding of essential transportation routes, and roadways being increasingly threatened by coastal erosion.

In chapter 15 of MM2045, Recommended Strategies, MDOT stated its commitment to improving the resiliency of its infrastructure and its commitment to promote freight service in the state. These include the following strategies:

- Strategy 5.1 “Identify and address risks to Michigan’s transportation network.”
- Strategy 8.1 “Promote freight service, infrastructure improvements, and intermodal connectivity.”

Integral to these strategies is that weather and climate threats are understood and addressed to mitigate adverse impacts to essential domestic and international industrial connections.

Michigan has initiated various projects aimed at addressing these vulnerabilities. These initiatives focus on enhancing the state's preparedness for intensified snowfall, ice, precipitation, and rising lake levels. Efforts include enhanced communication tools, infrastructure modifications, and coastal management strategies. These measures are critical for ensuring the reliability and safety of Michigan's freight transportation infrastructure in the face of evolving climatic and environmental conditions, reflecting a comprehensive approach to adapting to these multifaceted challenges. The following are descriptions of a number of these endeavors.

MDOT is also developing a Resilience Improvement Plan (RIP) to evaluate vulnerabilities, assess the risk associated with climate hazards, and identify strategies to improve the resilience of surface transportation facilities to climate hazards in Michigan. MDOT's RIP will contemplate the risks posed by three natural hazards - flooding, extreme heat, and coastal erosion - to its road, bridge, culvert, and pump station assets, and explore implementable resilience strategies that can reduce the impact of future climate events and assist with maintaining a safe and effective transportation system.

#### Mi Drive – Interactive Tool for Current Conditions

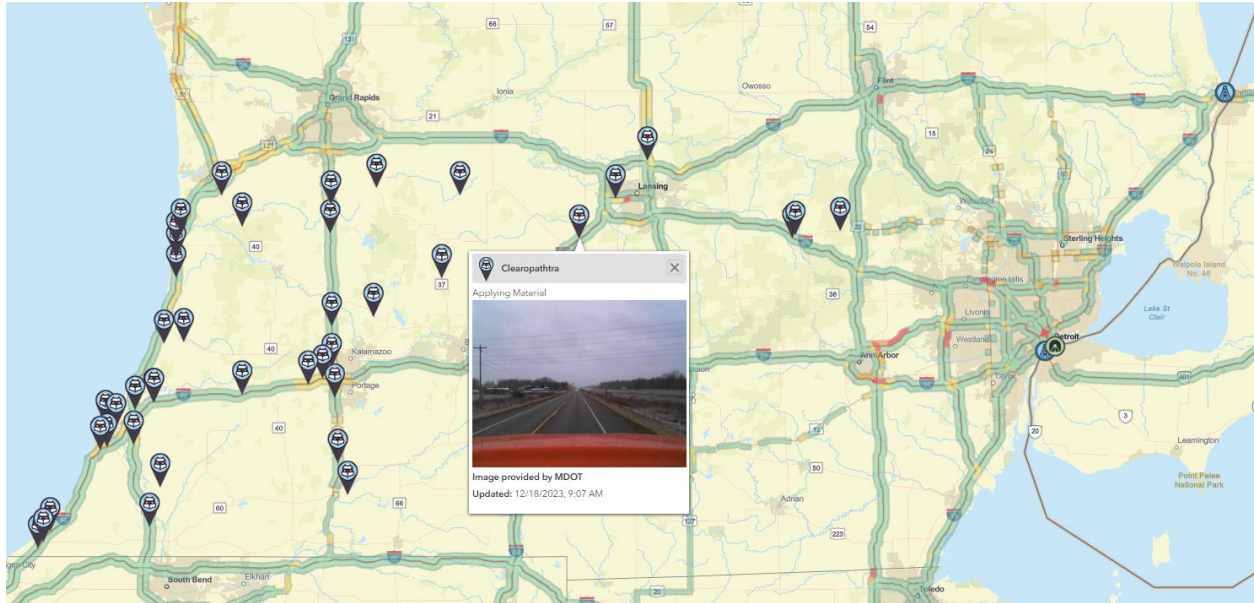
MDOT has developed Mi Drive, an interactive online platform that provides comprehensive, real-time information on road conditions and ongoing maintenance activities across state trunkline (I, M and US) routes. This web-based map is designed to enhance user interaction and situational awareness, offering various layers that can be toggled to display current road speeds, construction updates, live camera feeds, incident reports, precipitation, temperatures, wind speed, snowplow and maintenance vehicle locations, and available truck parking spots.

A particularly notable feature of Mi Drive is the maintenance vehicle layer, which allows users to view the real-time positions of these vehicles. This layer not only identifies the location of the maintenance vehicles but also specifies the type of maintenance work being conducted. Furthermore, equipped with onboard cameras, these vehicles provide real-time images of the roadways. During winter months or adverse weather events, this feature becomes especially valuable, granting road users – including commercial vehicle operators – the ability to visually assess road conditions and make informed decisions for their travel plans. Mi Drive's



integration of real-time data and interactive mapping technologies positions it as a critical tool for enhancing road safety and improving travel planning in Michigan.

Figure 4: Mi Drive Screenshot During Winter Weather in Southern Michigan



*Image Caption: Screenshot of Mi Drive online application during winter weather event in southern Michigan. Travel speeds and maintenance vehicle locations are displayed.*

#### I-94 Real-Time Warning – Dynamic Message Signs

MDOT effectively utilizes dynamic message signs (DMS) throughout the state to provide real-time information on road, weather, and traffic conditions. These electronic signs are integral in communicating crucial information to drivers, displaying a range of messages from travel times based on distances to automated congestion alerts derived from speed data. They also play a pivotal role in disseminating weather-related information, particularly for regional weather events.

In a significant advancement, following a comprehensive road safety audit triggered by a severe 193-vehicle pileup in January 2015, MDOT's Southwest Region has developed a weather-responsive advisory system along the I-94 corridor in Van Buren County. This area, known for its heavy traffic and vulnerability to intense winter storms, now benefits from an enhanced safety mechanism. The system integrates DMS with environmental sensor stations (ESS) and real-time data analytics to offer updated advisory speed limits and roadway condition information every 5 miles along the corridor. The primary objective of this system is to encourage safer driving speeds during adverse weather conditions, thereby reducing the risk of collisions and ensuring a smoother, more consistent traffic flow.

This approach by MDOT reflects a commitment to leveraging technology for enhancing road safety and underscores the importance of dynamic, real-time information systems in managing traffic effectively, especially under challenging weather conditions.

## Impacts of Freight Movement on Local Air Pollution

Chapter seven of MM0245 on Community, Environment and Health describes the environmental impacts associated with multimodal freight, including air quality and energy use. Since the development of MM2045, MDOT has engaged in several carbon reduction-related efforts.

### MDOT Carbon Reduction Strategy

The IIJA established the Carbon Reduction Program (23 U.S.C. 175 § 11403). The Carbon Reduction Program provides just under \$169 million of funding for Michigan to implement cutting edge projects to reduce transportation-sector carbon emissions. The IIJA also requires states to develop a Carbon Reduction Strategy by Nov. 15, 2023. A [Carbon Reduction Strategy](#) was developed by MDOT, in collaboration with statewide and regional stakeholders, to explore initiatives to reduce statewide transportation sector carbon emissions that reflect the carbon reduction needs and preferences of Michigan's diverse communities. Recommended carbon reduction performance metrics related to freight include:

- Charging infrastructure for electric vehicles (EVs) for on-road vehicles (buses, trucks, and cars);
- Charging infrastructure for EVs for off-road vehicles (maritime, aviation);
- Low-carbon fuel infrastructure for light and heavy vehicles (e.g., hydrogen fueling stations, renewable natural gas [RNG] fueling stations, low-carbon biofuel infrastructure);
- Reduce freight-related congestion and support freight route efficiency on the network (e.g., intermodal exchange, AI-based operations streamlining, curb management);
- Intelligent transportation systems (ITS) (e.g., electronic toll collection; ramp metering; traffic incident management); and
- Fuel standards (e.g., fuel efficiency, low carbon fuels).

Freight is an important element of Michigan's economy. An action plan to reduce freight-related carbon emissions would further reduce emissions associated with the transportation system. Currently, planning related to the reduction of freight-related carbon emissions are interspersed throughout MDOT's current plans. MM2045 outlines major strategies and is supplemented by a State Rail Plan focused on both passenger rail and freight rail. Creating a freight-specific carbon reduction action plan in the future would give MDOT a dedicated space to document current efforts and identify opportunities for improvements to the freight network that support carbon reduction.

## Michigan Maritime Strategy

Michigan's maritime industry is actively exploring innovative technologies and methods to reduce emissions and promote cleaner energy sources at ports. Additionally, MDOT and other state agencies are partnering to develop a Maritime Strategy for the State of Michigan. The strategy will advance greening, electrification, decarbonization, equity and environmental justice, infrastructure, and sustainability of Michigan's maritime sector while ensuring the efficient movement of goods. The development of the strategy is scheduled to begin in early 2024. MDOT looks forward to the ways in which the state can partner with the maritime sector to advance greener port operations to reduce emissions in local port communities.

## Impacts of Freight Movement on Flooding and Stormwater Runoff

### Stormwater System Improvements

In response to the escalating severity of extreme rainfall events, including the substantial rainfall that impacted southeast Michigan in summer 2021, MDOT is proactively enhancing its stormwater management capabilities. Central to this effort is the strengthening of pump stations, which play a pivotal role in stormwater control. MDOT is embarking on a comprehensive Power Redundancy Plan, which includes a detailed four-phase strategy, particularly focusing on Metro Detroit. This plan emphasizes the installation of permanent backup generators at pump stations across the state, aiming to guarantee continuous operation during power outages. The estimated investment for this initiative ranges from \$66 million to \$90 million.

A key element of MDOT's strategy involves building a significant drainage tunnel along I-94 in Metro Detroit, projected to cost around \$425 million. This large-scale project is intended to substantially enhance drainage capacity, preparing the region to handle potentially catastrophic flood events that exceed the 100-year flood level. The plan includes the removal of 15 pump stations and disconnection from the Detroit Water and Sewerage Department's combined sewer system. This move is aimed at addressing power capacity issues and minimizing the risk of flooding during intense rainfall periods. Through these measures, MDOT is demonstrating its commitment to bolstering stormwater management infrastructure.

Figure 5. Statewide Pump Station Generator Status Map

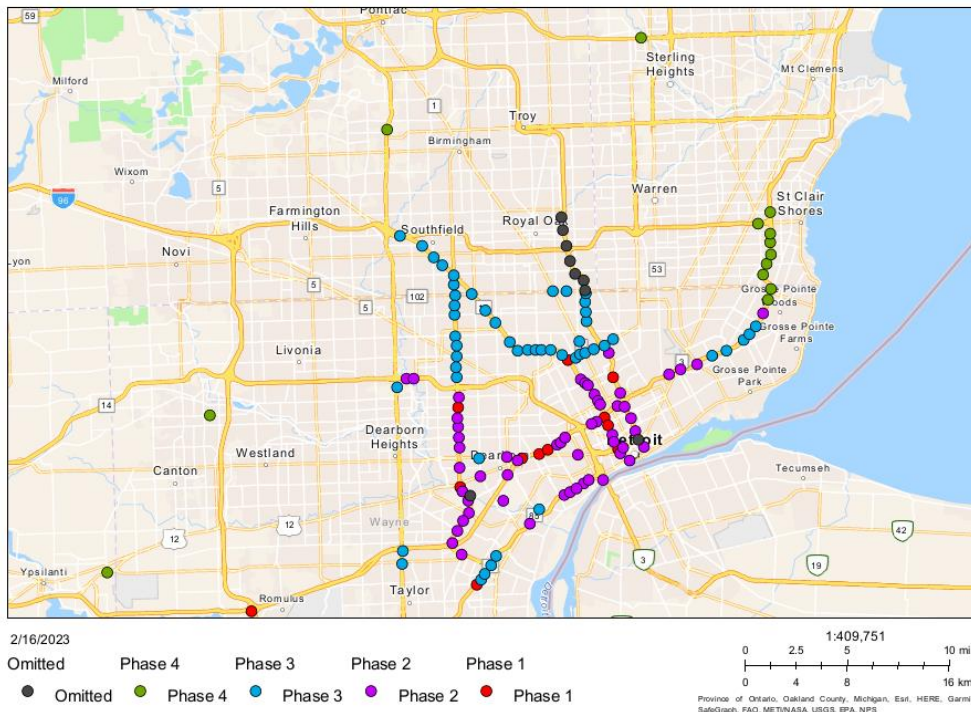


Image caption: A map depicting the pump station statuses in southeast Michigan.

### Great Lakes Water Levels

In recent years, the Great Lakes have displayed a marked increase in water level variability, presenting challenges for coastal infrastructure. According to NOAA data, the years 2019 and 2020 witnessed some of the highest water levels since records began in 1918. This significant rise starkly contrasts with the notably low levels observed in 2012 and 2013, which were among the lowest ever recorded. This pattern of fluctuation, potentially linked to climate change impacts, has led to unpredictable shifts in lake levels. Such variability has directly contributed to increased shoreline erosion, adversely affecting numerous roadways across Michigan. High water levels exacerbate erosion, threatening the integrity of adjacent roadways and resulting in structural damages, the formation of sinkholes, and the need for costly, extensive repairs.

MDOT has recognized these challenges and is actively implementing strategies to enhance the state's infrastructural resiliency. Key initiatives include fortifying roadways against erosion and, where necessary, rerouting them to bypass high-risk areas. A prime example of this proactive approach is the \$3.2 million project in Mackinac County, which relocated a segment of US-2 further from the Lake Michigan shoreline. Initially slated for 2021, the project's timeline was expedited in response to the accelerated erosion caused by the record-high lake levels in 2020. This initiative exemplifies MDOT's commitment to strategic, long-term infrastructural resilience in the face of fluctuating lake levels. It underscores the critical need for adaptive, proactive

infrastructure management to protect and sustain Michigan's vital transportation networks amid the challenges posed by natural environmental variations.

### Freight Movement and Wildlife Habitat Loss Mitigation

It is critical to the State of Michigan that projects help to conserve wildlife, natural communities, and ecosystems for the benefit of Michigan's citizens, visitors and future generations. The department is engaging in several efforts to mitigate the impact that freight infrastructure and goods movement can have on several species of wildlife in Michigan. One example is through MDOT's Pollinator Habitat Management Program. The FAST Act called for the use of integrated roadside vegetation management practices on roadsides and other rights of way, including reduced mowing and development of habitat and forage for Monarch butterflies, honey bees, and native pollinators through plantings of native grasses and forbs like native milkweed species to create migratory way stations for pollinators.

MDOT has developed a [Habitat Management Plan](#) to protect pollinators and their habitats in rights of way in response to pollinator population decline. By reducing negative impacts on pollinator habitat, improving existing habitat and creating new habitat in roadsides, the department can help pollinators by giving them safe travel corridors, food and shelter. Chapter seven of MM0245 on Community, Environment and Health further describes methods to mitigate the impacts of transportation projects on the natural environment.



*Image caption: An image showing a commercial vehicle driving alongside a pollinator planting area at the Coldwater Welcome Center in July 2023.*

In addition to our roadside management practices, Michigan is also focused on the protection of our native Great Lakes species. MDOT works closely with the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to monitor ballast water regulations for commercial vessels. These policies are protective of the environment, maintain efficient waterborne commerce and are critical to ensuring the ecologic and economic health of the Great Lakes region. They also help to prevent aquatic non-native species from entering and spreading within the Great Lakes.

Marine infrastructure also plays a role in protection from invasive species. In 2018, Gov. Whitmer announced an intergovernmental agreement that allowed Illinois to use up to \$8 million in funds appropriated in 2018 by the Michigan Legislature to support the pre-construction engineering and design (PED) phase of the Brandon Road Ecosystem Project. The Brandon Road Lock and Dam in the Chicago Area Waterway System near Joliet, Illinois, is a critical pinch point for keeping bighead, silver and black carp – the invasive carp species of greatest concern – out of the Great Lakes. The Brandon Road project will install layered technologies, including an electric barrier, underwater sound, an air bubble curtain and a flushing lock, in a newly engineered channel designed to prevent invasive carp movement while allowing barge passage.

Additionally, MDOT was part of a multi-state agency team that helped develop the [2023 Sustainable Small Harbors Guidebook](#). The guide serves to develop long-term, sustainable strategies that would enable Michigan's Great Lakes coastal communities to maximize the benefits of their harbor facilities in the face of challenges such as extreme water level variation, preservation of wetlands and invasive species management.