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# MPSCS: Michigan's Emergency Communications System

2025 Northern Michigan Ice Storm Response

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| <b>Award:</b>         | National Association of State Chief Information Officers (NASCIO)<br>State IT Recognition Awards                                                                                    |
| <b>Category:</b>      | Information & Communications Technology                                                                                                                                             |
| <b>State:</b>         | Michigan                                                                                                                                                                            |
| <b>Project Start:</b> | March 2025                                                                                                                                                                          |
| <b>Project End:</b>   | September 2025                                                                                                                                                                      |
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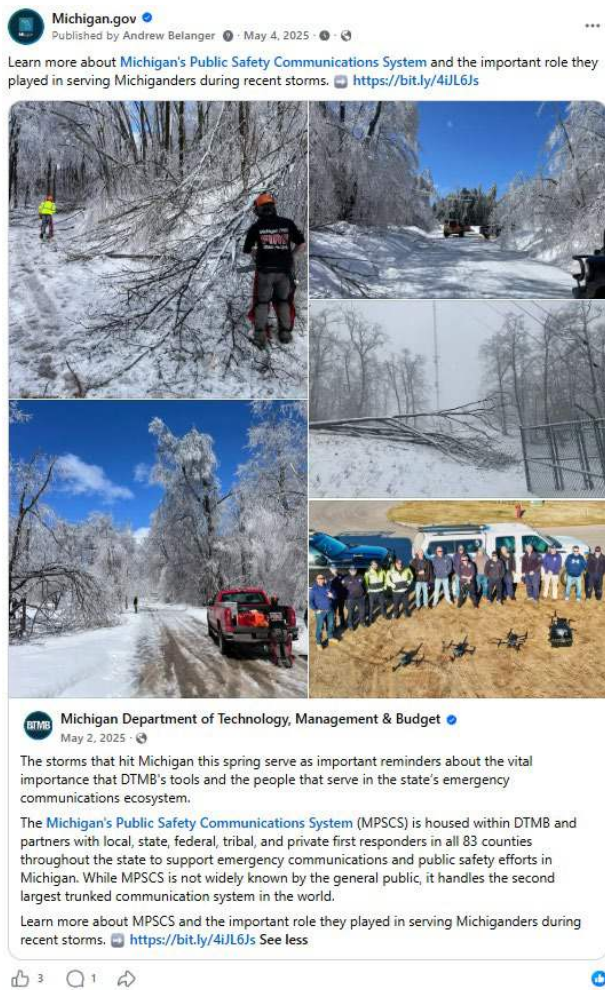
## EXECUTIVE SUMMARY

Michigan's Public Safety Communications System (MPSCS) is a mission-critical communications infrastructure designed to enable seamless coordination among local, state, federal, tribal, utilities, and private first responders in Michigan. Managed by the Michigan Department of Technology, Management & Budget (DTMB), the MPSCS system provides secure, reliable, and interoperable communication for law enforcement, fire services, emergency medical services, and other public safety entities.

In March 2025, Northern Lower Michigan, witnessed an unprecedented accumulation of freezing rain and ice impacting nearly 14,714 square miles. Ultimately, the ice resulting from this storm far exceeded predicted amounts and caused widespread outages to power, internet, phone (both cellular and landline), severely limited transportation, and threatened emergency first responder communications. The resulting power outages made finding gas, food and lodging for residents difficult, particularly in rural areas that were disproportionately impacted by the extreme weather.



The widespread harsh winter conditions necessitated the activation of the State Emergency Operations Center (SEOC) by Michigan Governor Gretchen Whitmer and the Michigan State Police, Emergency Management and Homeland Security Division (MSP/EMHSD). The SEOC is where state, local and federal agencies coordinate the response to a disaster, emergency or terrorist event.



Staff from MPSCS team played a vital role in the state's SEOC coordinated response during and after the storm. Preliminary damage assessment during the storm identified that nearly all MPSCS tower sites in the affected storm area were unreachable by vehicle and some points of ingress were so severely impacted that it would take days to gain access. Assistance from many local agencies and infrastructure and utility partners were limited, due to focus on restoration of consumer utilities along with life-safety concerns. MPSCS personnel quickly engaged in debris removal to allow access to tower sites and began the process of maintaining and restoring emergency tower communication conditions to normal.

Michigan's long-term investments, hardened infrastructure, and 24x7 operational readiness planning ensured the state's statewide, interoperable P25 Land Mobile Radio (LMR) network, remained fully operational. MPSCS became the sole reliable communications platform for police, fire, EMS, tribal responders, emergency managers, and utilities during the ongoing storm response.

The 2025 Northern Michigan Ice Storm highlighted the need for continued improvements to make the MPSCS system increasingly more resilient.

## IDEA

### What problems or opportunities does the project address?

The MPSCS maintains a robust statewide two-way radio system supporting over 153,000 public safety radios, utilities, and public works organizations daily, making it a critical component in any disaster response within the State of Michigan. This is particularly true when cellular communications are compromised and when systems become severely overloaded. At the onset of the storm, nearly all commercial systems in the storm's path were in some state of failure.



MPSCS tower sites have been exposed to numerous severe storms, tornados, ice storms, and blizzards over the years. Each of these tested the resilience of the network, but this storm was different. The 2025 Northern Michigan Ice Storm was widespread and intense, impacting 13 Michigan Counties and 1 Tribal Nation in Northern Michigan.

As MPSCS team members responded to clear debris to access MPSCS sites the priority became clear, ensure that generators continue to run while commercial power was restored. While well maintained, many of the tower site generators were near 30 years old and they only had fuel to last approximately 7 days. The initial ice storm power outages caused 33 MPSCS tower sites across 13 counties to switch over to redundant generator power.

There were two priorities related to the tower sites and generators, first, ensure ingress to the sites were clear so that propane could be delivered. Second, address maintenance and repair needs to sites while ensuring communications were not lost. This meant MPSCS staff in the field had to make repairs and perform maintenance in a timely manner so that backup batteries could carry the load but not be completely depleted during maintenance activities. Some generators failed during this incident requiring immediate repair. While these generator failures were not catastrophic, they did require rapid intervention and caused staff to pivot from debris clearing to repair critical pieces of equipment. As a result of the storm an improvement initiative was undertaken by MPSCS to improve tower site locations and equipment readiness.

### Why does it matter?

After the initial ice accumulation, falling ice caused extensive damage to MPSCS tower equipment. While the MPSCS network remained operational because of numerous redundancies, this development identified opportunities to add additional protection to ensure that similar weather events will not inhibit the state's ability to provide emergency communications in the future. The site and equipment readiness improvements includes additional tree removal near tower locations, generator replacement, and placing additional ice shields above MPSCS microwave dishes.





**Describe what makes the project innovative or distinct from similar initiatives.**

Improvements to tower site locations including tree removal, generator replacement, and placing additional ice shields above MPSCS microwave dishes were vital enhancements to ensure MPSCS can provide ongoing tower and system communications services. MPSCS has partnered with contracted partners to complete this work. It is anticipated that tower site improvements across the state will guarantee ongoing reliable communications system for decades to come.

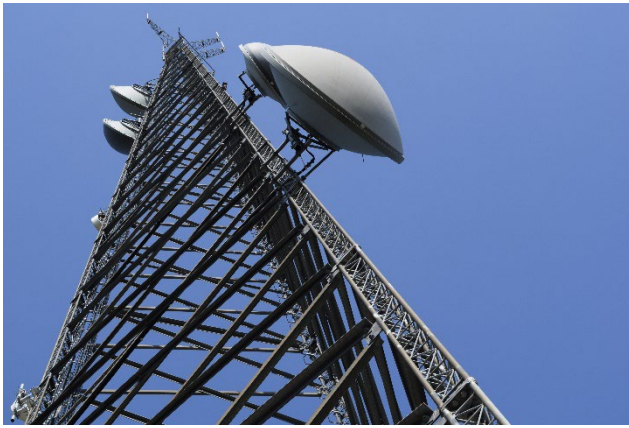
**What makes it universal?**

The MPSCS has been able to guarantee statewide interoperability, allowing agencies statewide to communicate across jurisdictions and with neighboring states such as Indiana, Ohio, and Wisconsin. The system also supports legacy and non-standard systems through gateways and patches and provides event-specific talk groups for coordinated emergency responses.

Improvements to tower site locations and generator replacements will ensure MPSCS can continue servicing Michigan's 83 counties. Tower services cover 59,415 square miles, and includes over 356 RF tower sites and 129 state and local dispatch centers. They support more than 153,000 public safety radios and 17,400 fire pagers, with 772 network-connected 911 dispatch workstations handling approximately 15 million push-to-talks per month. These users rely on MPSCS, the tower sites, towers and equipment to ensure there are no gaps in communication.

**IMPLEMENTATION****What was the roadmap and how does this project fit into an enterprise view?**

The Michigan Public Safety Communications Interoperability Board oversees governance, sets policies, and ensures the system meets evolving technological and operational needs. Ten years prior to the 2025 Northern Michigan Ice Storm, MPSCS began the process of converting the microwave backhaul network from a time division multiplexing (TDM) circuit-based network to internet protocol (IP)/multi-protocol label switching (MPLS) based network. The completion of this conversion in 2019 resulted in a self-healing network, allowing radio traffic to reroute across different paths during outages of primary paths such as microwave dish damage from falling ice. This resiliency permitted the communications network to remain functional even though several paths had been obliterated by falling ice.



Many of the critical microwave paths in the network are configured with two microwave dishes on each side in a configuration called “space diversity” to maintain the required reliability of the paths. During normal operation the microwave radios transmit out of the top dish with the lower dish only receiving. During the ice storm, several microwave paths had extensive damage to their top dishes severely degrading the signal received on the other side to the point that the paths became unreliable. Site maintenance technicians were sent out to change the wave guides (lines attaching microwave dishes to the microwave radio) so that the microwave paths remained operational. Longterm,

identified improvements to tower site locations and equipment will ensure continuation system service long into the future.

### Who was involved?

Teams from the MPSCS, DTMB, Michigan Department of Natural Resources (DNR) and the Michigan National Guard provided ongoing support for clearing trees and other debris from access roads leading to MPSCS sites. Some of these access roads had been blocked by fallen trees their entire length and road blockages measured upwards of a mile in length. During the initial response, trees were still falling due to the heavy ice load. Some locations needed to be cleared from debris more than once. Many locations were also covered with a deep layer of snow from a typical Northern Michigan winter. Most roads had downed power lines across them further complicating travel. These conditions made the task of clearing debris treacherous and slow going at times. Clearing access roads was imperative to enable fuel delivery for the tower site generators which had limited reserves. Utilities estimated it would be several weeks before power was restored in many areas.



The MPSCS contracted services from a reliable vendor to assist in replacing damaged tower equipment. The priority was those components critical to public safety communications. This included temporary replacement of microwave dishes, antennas, and associated lines. Furthermore, up to date engineering studies were needed to ensure that towers would support replacement equipment. The effort to recover from the effects of the ice storm are ongoing and are being conducted in concert with parallel efforts to further strengthen and enhance network reliability and resiliency.

### How did you do it?

With the activation of the SEOC and the Governor’s disaster declaration, MPSCS trained personnel began to staff the Emergency Support Function 2 (ESF2). ESF2 is the Federal government’s designated function for coordinating communications restoration, support, and operations during emergencies. It ensures that voice, data, and other critical communications remain operable and interoperable so emergency management and response can function effectively. MPSCS staff assigned to the SEOC worked in concert with utility partners to prioritize downed wire removal, and restoration of commercial power to public safety





infrastructure, assist and manage communications plans for local agencies, assign dedicated communication paths for responders and work with our commercial cellular carrier partners to deploy wireless connectivity to support shelters and response efforts. MPSCS staff also deployed emergency radios to the Michigan National Guard Base in Grayling to support incoming troops and their storm response recovery efforts.



As the storm progressed, warming temperatures and high winds began to melt the heavy layer of ice on impacted MPSCS towers. While the melting ice was initially welcomed, the resulting damage it created when it fell resulted in catastrophic harm to many of the tower and shelter components. Microwave dishes were heavily damaged if not completely severed from towers, damage to the shelters, utilities, fences, and anything within 50 feet of a tower were in jeopardy. Utility meters, exhaust hoods, and ice shields were completely obliterated by falling ice.

MPSCS quickly shifted recovery efforts to repairing the damaged equipment. The MPSCS network was still functioning, thanks in part to multiple levels of redundancy. However, those layers had been eroded, and the state was now without some of the secondary systems used for backup. Still running on generator power, it was necessary to begin assessing the extensive damage to the network. Additional staff were deployed, equipment was repaired, and systems were strengthened.

MPSCS established an on-site command post in Gaylord. There, MPSCS staff coordinated with State of Michigan, federal, and local resources in the SEOC for the state's response. The critical nature of coordinating fuel deliveries to sites became priority. Cataloging which sites had been cleared and what sites remained accessible was a monumental task. Complicating matters was the fact the Mackinac Bridge, the only route connecting Michigan's upper and lower Peninsula's, remained closed due to falling ice. The bridge closure trapped numerous resources in Michigan's Upper Peninsula, straining the existing resources in the lower peninsula. As the 2025 Northern Michigan Ice Storm transitioned from response to recovery the role of MPSCS field and SEOC staff was no less critical.

## IMPACT

### What did the project make better?

The widespread nature of this incident tested MPSCS staff, processes, equipment and the state's ability to provide ongoing service. This test highlighted the team's strengths and identified opportunities for improvement. Improvements to tower sites, equipment, and generators are ongoing. These improvements strengthen MPSCS to provide a reliable system for Michigan's first responders.

MPSCS's participation in the SEOC activities and planning paid dividends during this incident by developing lasting strong relationships. As an example, the impacted area along with numerous impassible roads made it impossible for teams to triage the impacted tower communication sites. The MSP Aviation Unit flew the hardest impacted sites with MPSCS staff on board relaying photos and videos back to the SEOC. This allowed the expeditious deployment of finite resources to the hardest hit sites for access clearing and damage assessment of antennas and dishes. These ongoing



The Northern MI ice storm has been challenging for everyone that lives here.

Lineman, first responders, utility crews, road crews, Michigan National Guard soldiers, volunteers and neighbors have all come together to help with recovery efforts.

Please call 211 if you need non-emergency assistance. 911 if you have an emergency.



10:04 AM · Apr 3, 2025 · 1,963 Views

interagency partnerships within state government and with local, federal and tribal partners make Michigan more prepared to respond to future events.



For 30 years, MPSCS has been the steady signal behind every call for help and every life saved. More than technology, it's trust.

Thank you to the responders and partners who give it meaning. Together, we look forward to the next 30 years of service.

[#MPSCS30Years](#) [#PublicSafety](#)



12:01 PM · Sep 2, 2025 · 432 Views

### How do you know?

The 30-year history of the MPSCS has witnessed the growth of a system built to support public safety communications for a single police agency statewide into an evolution of a system of dozens of sub-systems supporting public safety, utilities, tribal nations, and mass transit across every corner of this state.

While Michigan's communications network has enjoyed unprecedented growth into one of the largest of its kind in the world, along with this comes great responsibility. The responsibility to ensure that this communications network remains operational no matter the conditions. More than half of Michigan counties have enhanced coverage by adding infrastructure into the MPSCS, further improving interoperability, and emergency response efficiency.

### What now?

Multiple layers of redundancy continue to enable the MPSCS network to endure natural disasters and technical challenges. The network includes redundant pathways, backup power systems, and deployable emergency resources to maintain operations during disasters or hardware failures. Simulcast and site trunking technologies ensure continuous communication even if some sites lose connectivity.

MPSCS is currently undergoing a Lifecycle Remediation Project, upgrading core switching equipment, site repeaters, power systems, IP/MPLS backhaul, dispatch consoles, generators, and tower structures in an effort towards continuous improvement and resilience.