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IAEM Bulletin

In This Issue

International Association of Emergency Managers

Understanding the Limits of Drone Autonomy in Emergency Response: What Emergency Managers Should Know About Using Autonomous Systems Effectively

By Alessandro Saviolo, Ph.D., Research Engineer, New York University

Drones have become valuable tools for emergency responders, supporting missions such as locating missing persons, assessing infrastructure damage, monitoring floods and wildfires, and providing rapid aerial situational awareness without placing personnel in hazardous areas. As drone programs mature within emergency management, the conversation is shifting from whether to use drones to how autonomy might expand their operational role.

Advances in robotics and artificial intelligence have produced impressive demonstrations of drones navigating cluttered buildings, traversing wooded areas, and operating without GPS or direct piloting in constrained settings. These developments suggest a future in which autonomous drones could search disaster zones, locate survivors, and gather critical information while responders focus on higher-level decision-making.

However, disaster environments are very different from the settings in which many autonomy systems are developed and tested. They introduce uncertainty, degraded sensing, dynamic hazards, and incomplete information that remains difficult for autonomous systems to handle robustly. For emergency managers, the practical question is not whether a drone can fly without a pilot. It is when an autonomy system can be trusted, when it requires close supervision, and how it should be integrated into real operations.

How Drone Autonomy Works

Most autonomous drones rely on a sequence of functions often described as localization, mapping, planning, and control. In practical terms, the aircraft must estimate where it is, interpret what is around it, determine a safe path, and execute that path reliably.

Figure 1 illustrates this simplified pipeline. The key point is that autonomy depends on several components working together. If one becomes uncertain, that uncertainty can propagate through the rest of the system. In structured environments with reliable positioning, stable lighting, and limited obstacles, these systems can

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From the IAEM-USA President

March Through the Madness—Unifying Emergency Management

By Josh Morton, CEM, IAEM-USA President

It's hard to believe that it's already March. March Madness is already underway, and so is the NCAA basketball tournament!

In the coming weeks, we hope to see the release of the long-awaited FEMA Review Council Report and continued discussion of the FEMA Act. Both are likely to generate strong opinions across our profession, and understandably so. Emergency managers care deeply about the systems we rely on to support our communities, and when the future of those systems is being debated, emotions and perspectives run strong.

This moment presents us with an opportunity.

Right now, it feels like we are living in a moment defined by division. Differences of opinion have become lines in the sand. Conversations that should be constructive collaborations turn into heated debates over who is right and who is wrong. But, if we know anything from serving in emergency management, it should be that progress rarely happens in isolation.

Disasters do not respect jurisdictional boundaries, org. charts, or political party lines. When communities face the unthinkable, the response that follows relies on cooperation. Local, state, federal, non-profit, and private sector partners working side by side to find solutions to complex problems. That cooperative spirit is the defining strength of our profession.

Leadership in moments like this means leaning into that spirit of cooperation, even when our perspectives differ. Thoughtful disagreement is not weakness. In fact, that's how bad policy gets fixed and good policy gets better. The problem we face in this nation is not that we disagree, but that we struggle to find ways to make those disagreements productive.

As the FEMA Review Council completes their work and the FRC Final Report is released, and as discussions around the FEMA Act continue, there will undoubtedly be a wide range of ideas about what the future of emergency management in the United States should look like. Some will call for structural change. Others will focus on improving existing systems. Some will call for increased financial responsibility on the states. Others will call for increased federal funding. Some will advocate for a stronger federal presence. Others will advocate for stronger state and local programs.

Each of these perspectives deserves a seat at the table.

Moving forward requires more than sharing your opinion. It requires listening, really listening, to the experiences of others across the profession. State and local emergency managers bring insight from the front lines of disasters. Federal partners bring a national perspective and responsibility for administering programs that span an entire nation. NGOs, private sector partners, and community groups each see different pieces of the puzzle.

None of us sees the whole picture by ourselves.

The path forward for emergency management will be stronger if it is built through cooperation, not through competition. That means focusing on shared goals: helping our communities recover faster, strengthening preparedness, improving mitigation, and ensuring that the systems supporting our work are efficient, predictable, and sustainable. Systems and processes must be simple and consistent.

Josh Morton, CEM, President, IAEM-USA

Cooperation also requires a degree of humility. No single organization, agency, or level of government has all the answers. But together, our profession carries decades of experience responding to disasters, supporting survivors, and building more resilient communities. When we bring those experiences together constructively, real progress becomes possible.

The coming months will likely bring more spirited discussion about what the future of FEMA should look like and how federal policy should shape emergency management moving forward. That conversation is healthy and necessary. But the tone of that conversation matters just as much as the outcome.

If we approach these discussions with a commitment to cooperation,

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An Upgraded Member Experience Launching This Spring

Have you heard the news? There are exciting changes on the horizon for IAEM. This spring, we will be launching a new fully integrated membership database, brand new website and an enhanced online community platform to better serve and connect with our growing community. We believe this significant investment is a crucial step forward in how IAEM delivers value, resource and engagement opportunities for members around the globe.

In addition to the new membership database, you will experience a new website with improved navigation, easier access to the information you need and a streamlined way to explore upcoming events, programs, and resources. The upgraded online community will also provide you with a space for continued collaboration, discussion, and knowledge sharing across IAEM's groups, regions, councils, student chapters, and more. Together, our goal is that these upgrades offer a more seamless and enjoyable member experience for all who interact with IAEM.

Over the next few weeks, more details will be released as we prepare to introduce this next chapter for IAEM. Stay tuned for more information! 🔷

IAEM International Association of Emergency Managers

March Through the Madness

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seeking understanding, respecting different perspectives, and focusing on the communities we ultimately serve, our profession will be better for it.

At the end of the day, emergency management has always been a team sport. The challenges ahead will be no different. And if we lead with cooperation, we have every reason to believe that the future of our profession will be stronger than ever. As South Carolina Emergency Management Division Director Kim Stenson always says, "One team, one fight." 🔷

IAEM News to Know

Conference

■ EMEX exhibit booths are now available: The 2026 IAEM Annual Conference & EMEX will be held in Long Beach, California, this November and EMEX booth sales are now open. To view the floor plan, download a contract, read our quick facts, and review the exhibitor prospectus, visit our website.

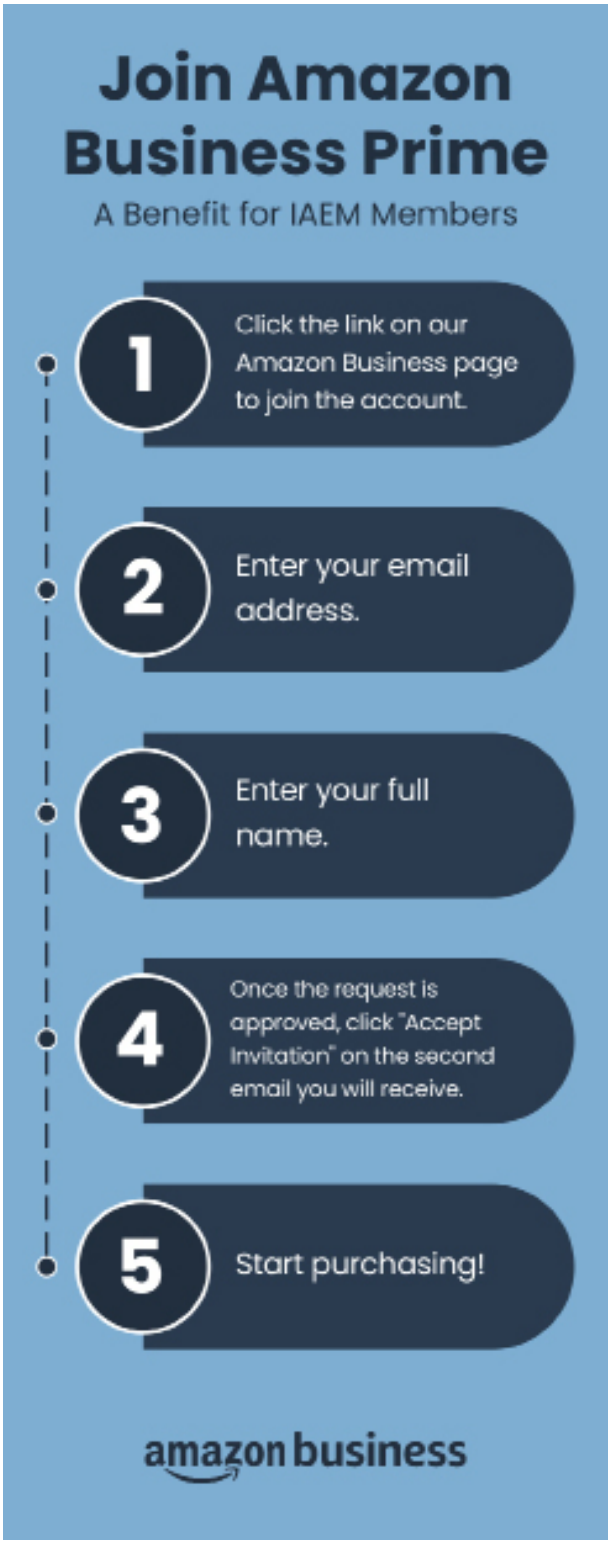
■ Poster Showcase submissions are now open. Elevate your work at the IAEM Poster Showcase—gather, inspire, and innovate with the brightest minds in emergency management! Check out the Poster Showcase Guidance for full details and submission guidelines. Posters will be displayed during the IAEM Annual Conference, Nov. 6-12, 2026, in Long Beach, California. Posters will be presented on Nov. 10.

Certification

■ If you're planning to pursue certification in 2026, visit the IAEM Certification website for helpful resources, including the upcoming review dates and information on scheduling the certification exam. Contact CertificationInfo@iaem.com with questions.

Awards

■ Nominations for IAEM Awards, including 40 under 40, will be delayed until early summer. Watch for social media and email updates.🔷



General Focus Articles

Submit an Article for the IAEM Bulletin

The IAEM Editorial Committee is currently accepting submissions for future editions of the IAEM Bulletin. Refer to the Author Guidelines for tips and techniques for successfully submitting your article for publication.

Special focus topics for the year include:

- April: Workforce Sustainability.
- June: Lessons Learned by Local Emergency Managers.
- August: Evolving and Emerging Risks.
- October: IAEM 2026: Charting through Preparedness Anchored in Resilience

- **Article Format:** Word or text format (not PDF).
- **Word length:** 750 to 1,500 words.
- **Photos/graphics:** Image format (png, jpg).
- **Email article, photos, and graphics to:** John Osborne.

Limits of Drone Autonomy

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perform well. Disaster environments rarely provide those conditions.

Figure 1. Simplified view of the autonomy pipeline used in many drone systems. To navigate safely, the vehicle must estimate its position, interpret its surroundings, plan a safe path, and control its motion. In disaster environments, uncertainty in any one of these stages can propagate through the system and reduce overall performance.

Where Autonomy Breaks in Real Environments

The limits of drone autonomy are best understood not as abstract technical challenges, but as specific failure points that emerge under real operating conditions. In emergency response environments, autonomy does not usually fail all at once. More often, it degrades through a combination of positioning, mapping, and perception problems that interact in consequential ways.

One of the clearest limits is **degraded positioning**. In dense forests, under canopy, indoors, underground, or near damaged infrastructure, GPS can become unreliable or unavailable. That loss of accuracy may introduce enough drift to make navigation in cluttered space unsafe, especially when obstacle-clearance margins are small.

A second challenge is **mapping in unknown and cluttered environments**. Many autonomy systems assume the drone can build and maintain a consistent map and use that map to plan safe paths. In practice, building that map in dense vegetation, complex interiors, debris fields, or partially observable terrain is computationally demanding and highly sensitive to sensing error. Small inconsistencies can accumulate, and the resulting map may no longer reflect the true layout of obstacles.

A third challenge is **degraded perception**. Autonomous systems rely on cameras and other sensors to detect obstacles, identify free space, and maintain awareness of relevant targets. In real deployments, smoke, dust, low light, motion blur, glare, and abrupt illumination changes can significantly reduce sensor performance. When perception degrades, the system's understanding of the environment becomes less certain, affecting both mapping and planning.

These challenges are not independent. Positioning errors affect mapping. Mapping errors affect planning. Perception errors affect both. Over time, these effects can compound, reducing performance even when no single component has failed completely.

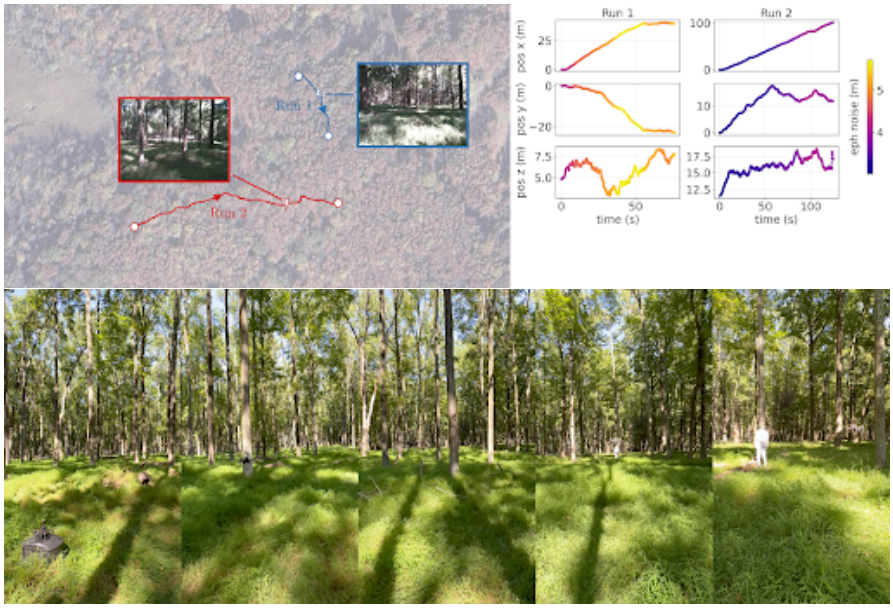

Figure 2. Autonomous drone testing under dense forest canopy, where degraded GPS caused large horizontal positioning error and reduced localization reliability in cluttered environments.

What Field Testing Revealed

In my doctoral research on autonomous aerial systems, these limitations appeared repeatedly in field testing. The limits of drone autonomy became clear not through a single catastrophic failure, but through repeated exposure to the conditions emergency responders face. Across these deployments, three constraints emerged: unstable localization, degraded or incomplete perception, and the physical stresses of sustained operation.

One of the most consistent lessons came from operations in forests and during indoor-outdoor transitions, where localization could become unreliable quickly. Under dense canopy, GPS error increased dramatically, at times enough to make precise navigation in cluttered space difficult to trust (Figure 2). Similar problems appeared when moving between indoor and outdoor settings. The issue was not only the loss or recovery of GPS, but the in-

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stability of the transition itself. Small state-estimation errors could quickly propagate through the rest of the system, affecting mapping, planning, and obstacle clearance.

A second lesson came from perception. In field experiments, perception quality was sensitive to conditions common in emergency response but often underrepresented in controlled testing. During high-speed vehicle-tracking missions, dust and suspended debris degraded onboard sensing and reduced confidence in scene interpretation (Figure 3a). During indoor-to-outdoor transitions, abrupt illumination changes saturated the camera image and sharply reduced usable visual information (Figure 3b). Facing the sun or highly reflective surfaces often made the autonomy stack struggle even more.

A related limitation appeared in outdoor depth sensing. Even in visually simple environments such as open park terrain, off-the-shelf stereo vision often produced reliable depth only at short range, leaving the vehicle with partial knowledge of obstacles and free space beyond its near field (Figure 4). More distant regions appeared sparse, noisy, or invalid in the reconstructed point cloud. That matters because emergency environments often demand decisions about terrain, obstacles, and route options beyond what low-cost onboard depth sensors can measure reliably.

Long-duration operations highlighted a third reality often overlooked in discussions of autonomy: physical endurance matters. Sustained flight introduced vibration, thermal stress, and wear that affected system performance. In one case, prolonged vibration contributed to a motor mount failure. In another, heat buildup during extended operations deformed plastic airframe components. These were not failures of planning or perception in the narrow algorithmic sense, but they were failures of autonomy as an operational capability.

Figure 3. Perception degradation during autonomous flight. (a) Dust from a pickup truck reduced visibility and introduced visual artifacts during vehicle tracking. (b) Abrupt illumination change during an indoor-to-outdoor transition saturated the camera image and reduced usable visual information.

Figure 4. Outdoor stereo vision in a simple park environment produced reliable depth only at short range, leaving distant regions sparse, noisy, or invalid in the 3D point cloud.

Taken together, these experiences shaped my research perspective. The central challenge is not simply making drones more autonomous under ideal conditions. It is designing systems that remain useful when localization is degraded, perception is unreliable or incomplete, and the platform is under sustained physical stress. In many cases, successful missions did not come from trusting the full autonomy stack end-to-end. They came from adapting the mission, sensing strategy, or level of human supervision to match the environment.

What Emergency Managers Should Look For

For emergency managers, the takeaway is not to reject autonomy, but to use it with calibrated expectations. Today, the most effective model is typically supervised autonomy, in which automated capabilities assist the operator while human oversight remains essential. The operator's role is not only to manage the drone, but also to recognize when the system is becoming less trustworthy.

That leads to a more useful way of evaluating autonomous systems. Instead of asking whether a drone can operate autonomously under ideal conditions, agencies should focus on how it behaves under degraded conditions: when GPS becomes unreliable or unavailable, when visibility is reduced by smoke, dust, glare, or low light, when localization or perception becomes uncertain, whether the system degrades gradually or fails abruptly, and how quickly a human can intervene.

These questions reflect operational reality more accurately than controlled demonstrations. The key issue is not whether autonomy works in ideal circumstances, but whether it

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Revolutionizing Emergency Alerts: Strengthening America's Response to Natural Disasters

By Tom Buono, CEO, AlertNow, LLC

Across the United States, a series of unprecedented disasters—catastrophic floods in Texas, raging wildfires in Los Angeles and Lahaina, and the relentless onslaught of annual hurricanes—have exposed alarming weaknesses in our nation's emergency alert system. These crises have not only tested our resilience but have also revealed a pressing need to strengthen how we warn and protect our communities.

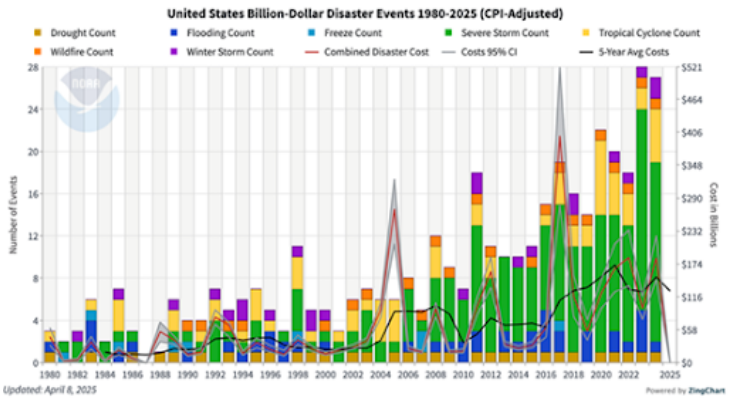
Example news stories that highlight weaknesses in emergency alert systems.

The staggering loss of life and widespread destruction underscore an urgent imperative: we can no longer afford to overlook the critical gaps in our emergency alert system. As communities struggle to recover, it is essential that we prioritize bold, innovative solutions to safeguard lives the next time disaster strikes.

Although most Americans have access to FEMA's Integrated Public Alert & Warning System (IPAWS) and NOAA Weather Radio (NWR), these systems are far from foolproof. In the chaos of an emergency, relying on a single mode of communication can mean the difference between safety and tragedy.

The Weather Radio service, while delivering crucial alerts from over 100 weather offices, struggles under the weight of its age and limitations. NOAA's 60-year-old infrastructure is not only costly to maintain but is also susceptible to outages at critical moments. Complicating matters, effective use of NWR receivers requires residents to purchase, configure, and tune these devices correctly, a hurdle that results in minimal adoption and leaves many unprotected when it matters most.

The stakes are clear, as shown in the included chart. Over the past 45 years, more than 400 catastrophic events have caused losses exceeding $1 billion, and the frequency of such disasters has doubled in just the last five years. This stark reality demands far more accessible, robust, and multi-channel emergency alert solutions and systems that can reach people wherever they are, on devices they already trust, and in ways that truly save lives.



United States billiion-dollar disaster events from 1980 to 2025, Consumer Price Index adjusted.

To transform the nation's public alerting capabilities, we must move decisively beyond incremental improvements. Two pivotal steps will unlock a future where every person can receive life-saving warnings without delay or disruption.

First, we need a resilient, multi-modal distribution network for mass notifications—one that does not rely solely on cellular networks, but instead weaves together a robust web of outreach channels. This ensures alerts can reach even the most remote or vulnerable populations, no matter the state of any single infrastructure.

Second, emergency notifications must be delivered straight to the devices trusted and used daily by the public and emergency managers alike. Whether through smartphones, computers, radios, or televisions, alerts should be impossible to miss in moments of crisis.

The multimodal distribution should include internet and LTE and can be augmented by satellite, NWR, and television datacasting.

Internet and LTE networks serve as the backbone for emergency communications, connecting both emergency managers and the wider public with speed and reach. Yet, for rural and remote communities, satellite and NOAA Weather Radio (NWR) play a vital role in bridging the gap where other networks may falter.

Television datacasting involves

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Revolutionizing Emergency Alerts

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sending encrypted content over a small portion of the television bandwidth to targeted receivers, unseen by the viewing population.

Harnessing the strengths of each of these technologies creates a resilient, layered alerting system—one that ensures every community, regardless of location or resources, is covered when disaster strikes.

The advantages of incorporating alerting over the ruggedized television infrastructure include:

- Reaching large populations simultaneously with a single transmission.
- Continuous operation during cellular network and power grid failures.
- Direct transmission to dedicated receivers in homes and businesses.
- Full integration with Wireless Emergency Alerts (WEA) and Emergency Alert System (EAS).
- Supported 24/7 by professional broadcast engineers.
- Secure, encrypted data transmission that does not interfere with core broadcasting operations.

Equally critical to the success of emergency alerting is delivering clear, attention-grabbing notifications directly to people's primary devices—using both audio and visual cues. Whether on mobile phones, desktops, smart home systems, alert beacons, or IP-based speakers, these alerts must be impossible to ignore, ensuring everyone receives vital information the moment it matters most.

Alerts must be impossible to ignore, ensuring everyone receives critical information in accessible formats the moment it is most actionable.

Next Steps: Advancing Emergency Communications

A resilient and comprehensive emergency communication system is not merely a goal—it's a necessity for every community in America. Each region faces its own set of challenges, whether from natural disasters, public health emergencies, or unforeseen crises that threaten safety and stability.

To meet these challenges head-on, we must invest in advanced, multi-platform alert systems that bridge the gap between traditional channels and cutting-edge technology. By doing so, we can guarantee that life-saving information reaches people everywhere, without delay.

This effort also means empowering emergency managers, state leaders, and communities with the training and tools needed to act swiftly and decisively when every second counts.

All of this is not a future concept; technology is here now and can be deployed immediately. By adopting these solutions, local towns and cities can build lasting resilience, protect lives, and provide peace of mind—ensuring that no one is left behind when disaster strikes. 🔷

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remains understandable, predictable, and manageable when conditions become difficult.

Looking Ahead

Autonomous drone technology will continue to improve. New approaches are reducing dependence on GPS, improving perception in degraded environments, and accounting for uncertainty more explicitly in real time. Those advances will make autonomous drones increasingly valuable in emergency response.

However, the near-term value of autonomy will depend less on full independence from human operators and more on integrating these systems in ways that account for their limitations. For emergency managers, understanding those limitations is critical. Autonomous drones can be powerful tools, but their effectiveness depends on using them in environments and roles where degraded behavior can be recognized early and managed safely. When deployed with that understanding, they can enhance situational awareness, reduce responder exposure, and support better decision-making in complex operations. 🔷

Leadership Breakdown, Local Resilience, and Collective Action: Lessons From "The Raft of the Medusa"

By James Johnston, Ph.D., CEM, Emergency Manager
City of Elko, Nevada

In 1816, a French naval frigate wrecked off the coast of West Africa due to leadership and governance failures rather than environmental conditions. With insufficient lifeboats, a large raft was hastily constructed and then abandoned at sea. After nearly two weeks of deprivation, only a small number survived. Théodore Géricault later transformed this event into The Raft of the Medusa painting, not to recount a maritime tragedy, but to expose what happens when institutions withdraw, and people are left to rely on one another. For emergency managers, the relevance of this image lies not in the shipwreck itself, but in what followed. The disaster deepened when leadership disengaged, and responsibility shifted downward. This mirrors modern emergencies, where large governmental systems may be delayed, fragmented, or constrained by policy. In those moments, outcomes are determined locally, often long before external assistance arrives. Empower decision-making at the lowest practical level by training and trusting supervisors and field leaders to act when speed and adaptability matter most.

On the raft, formal authority disappeared. Rank and position no longer mattered. Survival depended on shared situational awareness, cooperation, and the emergence of small groups that organized and supported one another. Research consistently demonstrates that resilience is fundamentally social rather than hierarchical (Aldrich, 2012; Tierney, 2014). Normalize collective problem-solving through cross-functional planning, shared ownership of outcomes, and exercises that reward coordination rather than individual performance.

The painting reinforces a central emergency management truth. Resilience is built laterally, not delivered vertically. Individuals who isolated themselves did not endure. Those who clustered, shared information, and coordinated efforts improved their chances of survival. This aligns directly with the Whole Community approach, which recognizes that preparedness and response capacity already exist within neighborhoods, organizations, and informal networks (Federal Emergency Management Agency [FEMA], 2011).

Théodore Géricault; The Raft of the Medusa

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Leadership Breakdown, Local Resilience

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Build and maintain social capital before disasters by investing time in relationships with community organizations, nonprofits, and informal leaders who will be present long before external aid arrives.

The distant ship on the horizon captures a familiar operational reality. Assistance may come, but it is rarely immediate. Hope is sustained not by waiting, but by visible action, communication, and shared effort. Clear messaging and credible signals preserve trust during uncertainty, while delays and ambiguity accelerate frustration and disengagement (Comfort et al., 2010). Prioritize clear and honest communication by stating what is known, what is not known, and what actions are underway. Credibility sustains resilience more effectively than reassurance.

While large government systems play an essential role, The Raft of the Medusa reminds us they are not the first line of survival. Preparedness, response, and recovery are fundamentally local acts. Fire departments, emergency managers, public works crews, healthcare providers, and community leaders become the functioning government long before state or federal resources arrive. When these local actors are trusted, trained, and empowered, communities stabilize faster and recover more effectively (Boin et al., 2017; Kapucu & Van Wart, 2017). Design plans for scarcity rather than ideal conditions by assuming delays in external support and preparing for extended local operations and staffing fatigue.

The moral weight of disaster also rests locally. When resources are scarce and decisions are difficult, it is local leaders and responders who carry the ethical burden. Prolonged scarcity and delayed support contribute to moral injury, burnout, and attrition across the emergency services (Tierney, 2014). Protect responders from moral injury through rotation, relief when possible, and explicit acknowledgement of the ethical strain placed on personnel during prolonged incidents.

Géricault's painting endures because it shows both failure and possibility. Institutions can falter. Systems can withdraw. Yet people who are connected, prepared, and willing to lead one another can endure far longer than expected. For emergency management practitioners, the lesson is clear. Resilience is not primarily a federal program or distant policy. It is a local capability rooted in trust, shared responsibility, and collective action.

Use after-action reviews as learning tools rather than fault-finding exercises, and apply lessons visibly so communities and responders see improvement translated into practice. Frame preparedness as a shared responsibility, reinforcing that resilience belongs to the whole community, not solely to emergency management agencies.

When communities are empowered to think, organize, and act together, fewer people ever find themselves on the raft. 🔷

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The Cleveland Clinic Healthcare Lifelines Framework: Operationalizing FEMA's Community Lifelines for Hospital Resilience

By Caroline Beckmann, MBA, Emergency Management Program Manager, The Cleveland Clinic; Luke Hall, CHEP, Emergency Management Program Manager, The Cleveland Clinic; Katie Lyden, MPH, PMP, Emergency Management Program Manager, The Cleveland Clinic; Phillip J. McHugh, MS, CPP, CHEP, AEM, Senior Emergency Management Program Manager, The Cleveland Clinic; Michael Odell Walker, JD, MPA, Emergency Management Program Manager, The Cleveland Clinic; Cameryn Weaver, MPA, Emergency Management Program Coordinator, The Cleveland Clinic

Hospital emergency managers operate at the intersection of clinical care, critical infrastructure, and community response. Yet, for decades, the emergency management tools available to hospitals have struggled to reflect this complexity accurately. FEMA's Community Lifelines Framework, introduced nationally in 2019 and formally integrated into CPG 3.1 in 2025, offered a transformative way to understand disasters by identifying and stabilizing the essential functions of a community. While the framework reshaped emergency management across federal, state, and local agencies, healthcare systems were left without a standardized, clinically meaningful way to translate the model into hospital operations.

In 2025, the Cleveland Clinic Department of Emergency Management recognized this gap and began developing a healthcare-specific adaptation that would align hospital emergency operations with FEMA's evolving national standard. The result—the Cleveland Clinic Healthcare Lifelines Framework—is now formally embedded in the health system's 2026 Emergency Operations Plan and represents a major innovation in healthcare emergency management.

This article introduces the model, outlines its applications across all phases of emergency management, and offers it as a potential blueprint for other healthcare systems seeking a more integrated, intuitive, and interoperable approach to resilience.

Why Healthcare Needed a Lifelines Model

Hospital operations depend on deeply interconnected systems to deliver clinical care. Power, water, sterilization, imaging, pharmacy, supply chain, transportation, and technology must work in concert as one continuous ecosystem to sustain this mission. A disruption in any one of these systems can cascade rapidly into multiple areas of care, rendering traditional hazard-based or department-based assessments insufficient for modern hospital complexity.

Consider a routine water disruption: it immediately impacts dialysis, laboratory analysis, environmental hygiene, cafeteria operations, fire suppression systems, and patient sanitation. Stabilizing and resolving the incident requires both technical understanding of complex water systems and prioritization based on impacts to clinical care - something not easily represented using standard continuity or ICS-based reporting tools.

FEMA's Lifelines Framework offered a compelling structure, but it was built for communities, not hospitals. Its subcomponents did not reflect clinical workflows, inpatient dependencies, or healthcare-specific sustainment needs. Cleveland Clinic's Emergency Management team saw an opportunity to bridge this gap by adapting the structure into a hospital-centric model.

Developing the Cleveland Clinic Healthcare Lifelines

The Healthcare Lifelines Framework preserves the logic and intent of FEMA's Community Lifelines—using plain language, visual status indicators, and functional groupings—while translating them into seven core lifelines specific to the provision and continuity of patient care. Each core lifeline includes defined subcomponents, measurable sustainment thresholds, and clear indicators of degradation.

While individual Cleveland Clinic sites vary in size and complexity, the core mission-sustaining components of our facilities remain consistent.

- **Clinical Care**: Encompasses the staff, environment, equipment, and systems required for the direct provision of patient care.
- **Clinical Support and Ancillary Services**: Includes the critical functions that support modern medical services and are fundamental to most patient treatment plans within the hospital setting.
- **Security and Safety**: Encompasses the personnel, policies, and systems necessary to protect caregivers, patients, staff, and visitors while accessing and operating within our facilities.
- **Supply Chain**: Provides the material resources required to deliver clinical care and sustain hospital operations.

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Cleveland Clinic Healthcare Lifelines Framework

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- **Infrastructure and Utilities**: Sustains the physical environment and essential utilities necessary for safe and effective clinical care.
- **Food and Hydration**: Ensures the ability to meet basic life-sustaining food and water needs for patients, caregivers, and staff.
- **Communications**: Sustains the interconnectivity required to coordinate, support, and integrate all other lifelines.

These seven lifelines were selected because they represent the minimum set of functional systems required to sustain patient care, support clinical decision-making, and maintain safe hospital operations during disruption. Together, they capture the most critical interdependencies that determine whether a healthcare facility can continue to deliver care, stabilize operations, and recover effectively. These lifelines are embedded in multiple programs within the EOP, including incident escalation, 96-hour planning, continuity of operations, and after-action reporting.

The intent is straightforward: to provide an intuitive, operationally meaningful way to assess a hospital's functional status—one that extends and aligns with FEMA's national framework while speaking the language of healthcare.

Applying Healthcare Lifelines Across All EM Phases

A major advantage of the model is that it spans and unifies the entire emergency management cycle, providing a consistent framework across mitigation, preparedness, response, and recovery.

Mitigation: Healthcare Lifelines integrates directly into the Cleveland Clinic's annual Hazard Vulnerability Analysis (HVA). Rather than assessing hazards in isolation, teams now layer lifelines into the risk analysis to evaluate how each hazard could impact specific lifelines. This approach creates clearer mitigation priorities and enables stronger all-hazards continuity planning by focusing on the lifelines most commonly or most severely affected.

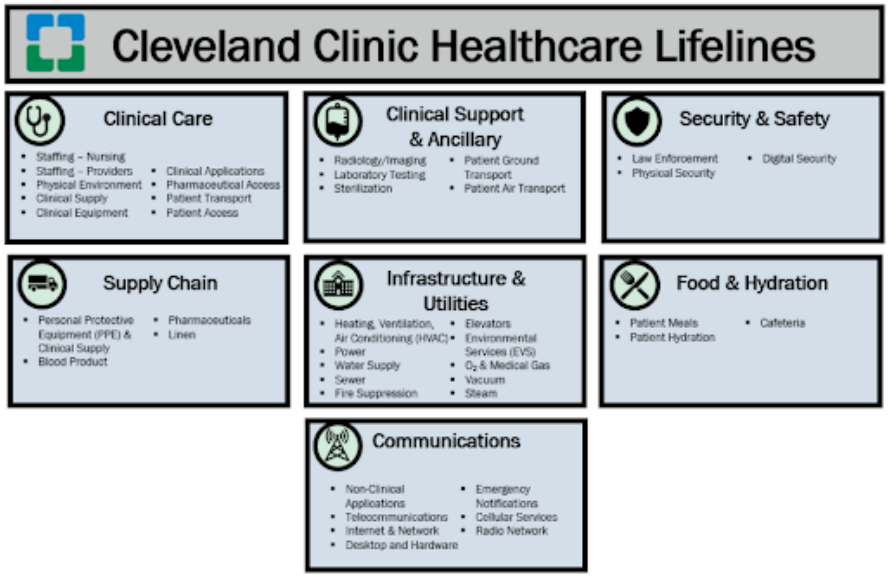
Preparedness: Lifelines form the structure for 96-hour sustainment planning, business resiliency plans (BRPs), training, and education tools, and tabletop and functional exercises. Staff moves away from siloed thinking and toward a shared understanding of functional interdependencies.

Response: This is where the model's value becomes most apparent. During any incident activation, the Healthcare Lifelines Framework allows IMTs to rapidly identify degraded functions and communicate them through the ICS sections, hospital command center, and executive leadership.

Instead of lengthy narrative updates, the Incident Commander and executive leadership receive a concise visual snapshot - identifying which lifelines are degraded, why they are degraded, and the associated cascading impacts - using a simple traffic-light visualization.

This approach improves prioritization, resource allocation, operational clarity, and decision-making at the executive level. It also enhances interoperability with local EOCs that already use FEMA's lifelines.

Recovery: Recovery is often the least standardized phase of healthcare emergency management. The Healthcare Lifelines Framework provides a clear, consistent structure for Impact and Damage Assessment Reports (IDARs), recovery status scoring, root-cause analysis, and improvement planning. By assessing each lifeline's level of restoration, the Incident Management Team can communicate a clear path back to normal operations, identify remaining degradations, and guide targeted recovery strategies.



Seven lifelines, selected to represent the minimum set of functional systems required to sustain patient care, support clinical decision-making, and maintain safe hospital operations during disruption.

Benefits to Healthcare and Emergency Management

The model meaningfully improves emergency management in several ways:

- Standardized, intuitive report-

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Cleveland Clinic Healthcare Lifelines Framework

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ing that executives and clinicians can immediately understand.

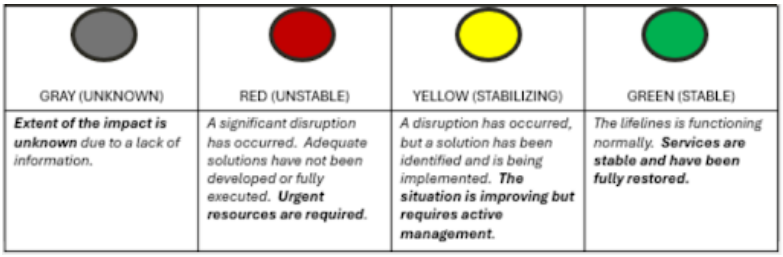
- Enhanced situational awareness during fast-moving or complex incidents.
- A structured method for continuity planning that unites clinical and non-clinical functions.
- Improved multi-site coordination and resource sharing across a large health system.
- Closer interoperability with community partners who use FEMA's lifelines during EOC activations.
- A scalable model that can be adopted by hospitals of any size, with adaptable lifeline subcomponents.

Perhaps most importantly, the model reframes resilience from a departmental issue to a functional systems issue—a shift long recognized as necessary in healthcare emergency management.

Limitations and the Path Forward

The Healthcare Lifelines Framework is newly implemented, and it has not yet been validated through a major real-world incident. Cleveland Clinic expects to refine the model through exercises, ICS activations, after-action reviews, and feedback from emergency management peers across the country.

For that reason, we believe publishing now is not only appropriate but beneficial. Early visibility invites critique, collaboration, and adoption from other systems - much like FEMA encouraged when it first introduced Community Lifelines nationally.



A simple traffic-light visualization is used in place of of lengthy narrative updates.

UNIT-LEVEL IMPACT AND DAMAGE ASSESSMENT REPORT (IDAR)

Unit/Dept:	Emergency Department	**Reporter:**	Jane Doe (ANM)
Date of Report:	October 9th, 2025	**Phone:**	555-555-5555 ext. 1023
Time of Report:	04:00	**Email:**	JANEDOE@CCF.ORG

CLINICAL CARE	CLINICAL SUPPORT & ANCILLARY	COMMS	SECURITY & SAFETY	INFRAS. & UTILITIES	FOOD & HYRDATION	SUPPLY CHAIN
Staffing- Nurses	Radiology / Imaging	Non-Clinical Applications	Law Enforcement	HVAC	Patient Meals	PPE & Clinical Supply
Staffing- Providers	Laboratory Testing	Telecom	Physical Access	Power	Patient Hydration	Blood Product
Physical Environment	Sterilization	Internet & Network	Digital Security	Water Supply	Cafeteria	Pharma. Supply
Clinical Supply	Pt. Ground Transport	Desktop & Hardware		Sewer		Linen Supply
Clinical Equipment	Pt. Air Transport	Emergency Notifications		Fire Suppression		
Clinical Applications		Cellular Services		Elevators		
Pharm. Access		Radio Network		EVS Services		
Patient Transport				Steam		
Patient Access				O_2 & Medical Gas		
				Vacuum		

Notes: Patients are backing up in ED due to inability to move them for tests. EPIC is completely down. BCAs not functioning. Downtime handoffs are not working between ED/Imaging/Lab. Holding 27 patients in the lobby.

The simple traffic-light visualization in practice communicate to the Incident Commander and executive leadership a concise visual snapshot identifying which lifelines are degraded, why they are degraded, and the associated cascading impacts.

Conclusion

The Cleveland Clinic Healthcare Lifelines Framework represents a meaningful advancement in hospital emergency management and continuity planning. By adapting a national framework into a healthcare-specific tool, we have created a standardized and intuitive method to measure system resilience, guide incident response, and prioritize recovery.

We share this model with the broader emergency management community not as a finished product, but as a foundation - one that we hope will stimulate discussion, collaboration, and innovation across healthcare systems nationwide. As disasters grow in complexity, hospitals need tools that can match that complexity with clarity. Healthcare Lifelines offer a promising path forward. 🔷

Trust Is Infrastructure: Why Founding Principles Still Matter in Crisis

By Kevin Robins, Emergency Management Specialist, Spokane Colleges, Spokane, Washington

We've seen it before. A head of state stops arguing with facts and starts arguing with insults. International relationships become conditional loyalty tests, with humanitarian aid, trade, or defense support dangled like bargaining chips. Appointees begin speaking in rehearsed hymns to the leader's genius. And almost on cue, public trust thins into skepticism, skepticism hardens into cynicism, and cynicism spreads into mistrust of the institutions that give a society its character.

What's maddening is that none of this is novel. It's as old as politics itself. So why do we keep repeating such an obvious mistake?

Part of the answer is uncomfortable: performance is easier than principle. Fact-based discourse is demanding. It requires attention, patience, and a stomach for complexity. Name-calling and belittling demand almost nothing. They reduce politics to a simple story—heroes and enemies; winners and losers. That narrative is intoxicating in anxious times because it feels decisive even when it's hollow.

Plato warned of this in The Republic. He described a democracy that grows weary of its own messiness and becomes seduced by a "protector" who promises certainty and order. The people don't invite a tyrant because they love tyranny; they invite one because they're exhausted. They trade the slow work of shared governance for the fast comfort of a strong voice. The tragedy is that the protector rarely protects anyone but himself.

Fear accelerates the slide. When leaders govern by threat—pulling enduring support from allies, leveraging aid against weaker nations, making relationships hinge on personal loyalty—fear moves to the center of public life. People and partners become less concerned with what is right than with what is safe. Once fear becomes the organizing principle, institutions that once felt sturdy begin to look fragile. Even honest rules start to feel optional if the powerful can ignore them without consequence.

This dynamic doesn't just corrode diplomacy. It corrodes language. Thucydides, chronicling the Peloponnesian War, observed that social breakdown begins when words lose their meaning. Caution becomes cowardice. Restraint becomes weakness. Cruelty becomes strength. When leaders model contempt for truth and decency, citizens slowly recalibrate around the same distortions. It isn't only policy that degrades—it's the moral vocabulary of the culture.

Then comes the cult of flattery. We should not underestimate the danger of political environments where every success is attributed to one leader's brilliance and every doubt is treated as betrayal. Aristotle argued that healthy regimes exist for the common good and deteriorate when public office becomes a path to private adoration. Flattery insulates power from friction, and friction is where reality lives. A leader surrounded by worship stops receiving correction. Errors become habits; habits become doctrine; doctrine becomes destiny.

Another driver is inequality. When the distance between the haves and have-nots expands, moral appeals start sounding like a luxury language. People who feel abandoned inevitably distrust institutions that preach patience while sputtering on delivery. Into that void steps the demagogue with a counterfeit promise: "The system is rigged. I alone can fix it." Often the first half is true. But the second half rarely is. Anger is easy to recruit; rebuilding is not.

So yes, we drift from core principles—but usually not in one dramatic moment. We drift by neglecting the small, boring reps that keep a civic culture fit: teaching how institutions work, enforcing standards consistently, practicing respect even in disagreement, and rewarding competence over spectacle. Virtue isn't lost overnight; it erodes through a thousand unremarked shortcuts.

We also repeat the mistake because virtue can feel dull. Ethics don't trend. The careful maintenance of alliances, aid, trade agreements, and democratic norms look mundane until it disappears. Like oxygen, institutional decency is most noticeable when it's gone.

For emergency managers, this is not just political philosophy. It is an operational reality. Public trust is a form of infrastructure: largely invisible when healthy, and painfully obvious when it fails. In our line of work, compliance and cooperation aren't guaranteed by authority alone. They are granted by credibility.

When institutions are treated as punchlines, the effects show up in response and recovery. People hesitate to evacuate because they distrust official warnings. Rumors outrun facts because the public has been trained to believe that "leaders lie anyway." Mutual aid becomes harder when partners assume every agreement is

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Trust Is Infrastructure

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temporary or transactional. Even the simplest protective action—shelter in place, avoid a hazard zone, follow reunification procedures—depends on a baseline belief that the system is not a con and that the people speaking for it are not performing.

This is why demagoguery is a resilience issue. A society that normalizes contempt for truth becomes vulnerable to every form of hazard: natural, technological, and human-caused. When leaders punish honesty and reward flattery, the information environment degrades. When the public comes to expect threats and insults instead of reason, it gets harder to sustain the shared discipline that crisis demands.

The Greeks didn't offer a magic cure. What they did offer was a constant reminder that character is structural. A society survives not only on laws but on habits of truthfulness, restraint, and shared obligation that make laws credible. In modern terms, the "soft stuff" is hard infrastructure. Trust is how you move a population. Trust is how you keep a recovery coalition together after the cameras leave. Trust is how you persuade people to endure short-term hardship for long-term safety.

So, what does this mean for our profession?

First, we can't control political culture, but we can model its opposite. Emergency management is most effective when it is visibly principled: honest about uncertainty, consistent in standards, and grounded in service rather than spectacle. Every time we speak plainly, avoid partisan traps, and tell the public what we know (and what we don't), we reinforce that institutions can still be worthy of trust.

Second, we can treat trust-building as a year-round mission, not a disaster-time accessory. Relationships formed only in crisis are fragile. Relationships maintained in calm seasons are resilient. That includes community groups that don't naturally trust government, campus populations that cycle every term, and partner agencies that may feel stretched thin.

Third, we should recognize that cynicism is its own hazard. It is not a mood; it is a vulnerability. The more normalized cynicism becomes, the less effective every warning, every evacuation order, every recovery plan. That means risk communication must include rumor control, two-way listening, and the humility to admit mistakes publicly and correct them quickly.

The real question beneath all our politics is moral: Do we want power more than we want goodness? If we want goodness, the price is eternal vigilance not only against demagogues, but against our own appetites—for certainty, for spectacle, for revenge, for the comfort of being on a winning team.

The pattern is ancient. That's exactly why it should scare us. We've been warned by history's best observers. Knowing the pattern is half the job. Refusing to become it is the other half. For emergency managers, that refusal is not abstract. It is a daily investment in credibility that keeps people alive. 🔷

When It Comes to Suicide Prevention, More Leaders in the Emergency Management Field Are Understanding the Importance of Postvention

By Amy Cook, MBA, Director of Training, National Alliance on Mental Illness (NAMI) of New Hampshire

Sadly, suicide is still a leading cause of death around the globe. And there's an increasing understanding of the unique risks in the emergency management field. A poster showcase at last year's IAEM conference reached a sobering conclusion: emergency managers are five times as likely to be at risk for suicide. In "Assessing Mental Health and suicide risk in Emergency Managers," they reasoned that given the unique stressors of the work, the fact that emergency managers work in high-risk regions, and have repeated exposures to disasters, they may be at higher risk than the general population.

This is not the first time the alarm has been sounded. Studies have shown that first responders, including law enforcement officers, police, EMTs, paramedics, and public safety telecommunicators, have an elevated risk.

We're seeing an increasing number of emergency managers at our postvention training —a growing area of suicide response that teaches community leaders how to support survivors and help the community heal after a suicide. They're not just here to help the communities that they serve; they're here for peers and colleagues, and for themselves. That includes one police chief in a small community in Wisconsin, which had seen a spate of teen suicides.

He saw the toll it was taking on his officers, many of whom were new to the force. "It was traumatic," he said. "I could just see it in their eyes. And the silence was deafening. Our police academies prepare us to respond to a lot of calls for service, but in school, you can't replicate the scenario of having a dead 12-year-old, screaming siblings and parents, and being there to console them. I think my staff was looking at me and saying 'what can we do? This is not something we can do on our own.'"

In postvention, participants learn best practices for supporting survivors and effectively preventing future suicide incidents, such as contagion, a cluster of suicides, or attempts.

Postvention covers a wide range of questions that every community faces after a suicide, including what safe and sensitive messaging is, how to handle memorials, how to respond to media inquiries, and what support to provide survivors in the aftermath of an event. Participants leave with the blueprint for how and when to communicate with survivors, and coordinate resources for support. They finish training with a protocol that's tailored to the needs and context of their communities.

"It's cohesive," said one participant from a community that saw three suicides among middle school students in three months last year. "In the past, it's been more of a haphazard process, not knowing who to reach out to, who is going to coordinate a team, talk with the family, talk with the media, and whether to close the office. Having a plan allows each program and department to know what we can do so we can focus more on the emotional piece and providing the survivors the support they need."

Postvention training is critical in emergency management and disaster preparedness planning because a suicide death can profoundly impact entire communities and interconnected systems, extending far beyond the surviving immediate family members. Community healing from the trauma of a sudden, unexpected death often requires a proactive, coordinated response across agencies over months or years; without it, communities may experience surges in crisis calls, school absences, workplace disruptions, and increased strain on emergency responders, mental health providers, and faith leaders. In the absence of a coordinated postvention approach, inconsistent messaging, unplanned memorials, and gaps in follow-up support can unintentionally increase distress and further suicide risk—particularly among youth and other vulnerable groups.

An increasing number of organizations, government agencies, and private-sector organizations are seeking postvention training. First, many organizations have experienced firsthand how unprepared they felt after a suicide loss—and how quickly confusion, miscommunication, and unintended harm can spread without a clear plan. Emergency managers are realizing that postvention isn't optional; it's an essential part of crisis readiness and disaster or emergency preparedness. At the same time, awareness has grown around the unique needs of survivors of suicide loss and the elevated risk of contagion, especially among youth. As communities grapple with rising mental health challenges and the increased visibility of suicide in the media, leaders understand that

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Weather Forecasting Is Public Safety, Not a Product—Because Tornadoes Don't Accept Credit Cards

By Jem Busse, Deputy Director, Bartholomew County Emergency Management, Indiana

There has been growing discussion around the privatization of weather forecasting. Proponents often frame this shift as innovation-driven or efficiency-focused, but I strongly disagree with the underlying premise of forecasting being sold as a service or product. At its core, weather forecasting is not a luxury service or a market commodity—it is a public safety function.

Accurate, timely weather information plays a direct role in protecting lives and property. Forecasts guide decisions for emergency managers, public safety officials, transportation departments, utilities, schools, hospitals, and everyday individuals making choices about travel or preparedness. Severe weather warnings, flood forecasts, winter storm outlooks, and heat advisories are not just simple conveniences; they are safeguards. And they should never become a luxury.

Access to clear and reliable weather information can mean the difference between safety and disaster. Treating that information as something to be bought, sold, or restricted undermines its very purpose. Public forecasting ensures that everyone, regardless of income, location, or technical resources, has access to potentially life-saving information. Privatization risks creating a two-tier system: those who can afford premium data and those who cannot.

Weather does not discriminate, and neither should access to forecasts or warnings. Rural communities, low-income households, and vulnerable populations are often the most exposed to weather hazards. These are the very groups that would be most harmed by reduced or paywalled access. If core forecasting responsibilities shift toward profit-driven models, there is an inherent risk that decisions become influenced by market incentives rather than public need.

One troubling trend that's tied closely to privatized and internet-based forecasting is the rise of fear-driven messaging. When attention equals revenue, the incentive quietly shifts from being right to being alarming. Worst-case scenarios are framed as likely outcomes. Model outliers are promoted to headlines. Ordinary uncertainty is repackaged as an impending catastrophe. The forecast becomes less about informing the public and more about keeping eyes glued to screens. From an emergency management perspective, this is dangerous.

Fear-mongering erodes public trust. When every storm is framed as historic and every system as catastrophic, people eventually tune out. Warnings lose their meaning. Urgency blurs into background noise. And when a truly high-impact event arrives, convincing the public to act becomes harder, not easier. It also complicates response. Emergency managers depend on clear, measured messaging to drive appropriate action. Inflated forecasts can trigger unnecessary panic, resource strain, and decision fatigue. Good forecasting respects uncertainty without exploiting it. Public agencies are built to communicate risk responsibly, not sensationally.

Effective forecasting is built on trust. Communities rely on forecasters to provide unbiased information, even when the message is inconvenient or unpopular. Public agencies are accountable to the people they serve, with oversight, peer review, and open communication. Introducing profit motives into the core forecasting process risks eroding that trust. Forecasts should never be influenced by who is paying for them.

Advocates for privatizing weather forecasting often make a few familiar claims. They deserve a response:

To those who say "the competition improves accuracy…"—Weather forecasting is not a bake-off where we crown the winner with the fluffiest croissant. Accuracy improves through collaboration, shared data, peer review, and scientific transparency. Fragmenting forecasting into proprietary silos may produce better marketing, but it does not inherently produce better warnings when lives are on the line.

To those who say "private companies are more efficient…"—Efficiency measured in profit margins is not the same as efficiency measured in lives saved, disasters mitigated, or communities prepared. Public forecasting is designed to serve everyone, including those who will never be profitable customers. It is the entire point.

"The government should stay out of the way…"—This argument treats weather as a commodity instead of a shared risk. Tornadoes, floods, heat waves, and blizzards do not politely check who paid for premium access before showing up. Public forecasting exists because collective problems require collective solutions.

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Weather Forecasting Is Public Safety

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From an emergency manager's standpoint, weather forecasting is not an abstract science but is an operational dependency. What I need most is not competing forecasts arguing with each other in the background, but a trusted, consistent, shared source of truth that everyone (emergency management, public safety, utilities, transportation, schools, media) can align around. Public forecasting provides that common operating picture. Being opposed to privatization does not mean being opposed to innovation. The private sector plays a valuable role in communication, visualization, specialized services, and technology development. That role should complement, not replace, a strong public forecasting foundation.

Weather forecasting is a public safety service, just like fire protection, emergency dispatch, and disaster response. It should remain publicly funded, universally accessible, cautious, tactful, and focused solely on protecting lives and communities.

Weather forecasting belongs to everyone. 🔷

Importance of Postvention

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a thoughtful, coordinated response can protect vulnerable individuals, stabilize the environment, and lay the groundwork for long-term healing. All of this has created a shift. Postvention is no longer viewed as a specialty topic—it's becoming a core component of comprehensive suicide prevention.

When done right, postvention becomes an important form of prevention. Research shows that up to 135 people are impacted by every person who is lost to suicide. Given that people who are exposed to suicide are at a heightened risk themselves, that postvention response becomes particularly important.

Just as impactful for participants, said another past participant in a community that had seen a spate of youth suicides, is that it helps various community stakeholders to form a coordinated response team that is operating from the same playbook.

"There was a time when we felt that we were in this effort alone," he said. "Now, we know that we have partners in the community. We realize that we're all better together, much more powerful than working in our silos."

Call or text 988 24/7, free and confidential support for people in distress, prevention and crisis resources for you or your loved ones, and best practices for professionals. (Chat option is also available at 988lifeline.org). If you or someone you know needs immediate support, you can call, text, or chat confidentially with a trained crisis worker 24/7 through 988 at no cost. 🔷

EM Calendar

April 8	K-12 Playground Chat – Stronger Together: Aligning Hospitals and Schools for MCI Reunification Success
April 20-24	2026 NJEPA Conference Hard Rock Hotel & Casino, Atlantic City, New Jersey
May 10-15	Governor's Hurricane Conference Palm Beach, Florida
May 26-29	TDEM Conference Fort Worth, Texas
July 29-30	IAEM-USA Region 7 2026 Conference University of Nebraska Omaha, Omaha, Nebraska
Aug. 10-13	National Homeland Security Conference Kentucky International Convention Center, Louisville, Kentucky
Aug. 11-12	IAEM-USA Region 9 Symposium 2026 Japanese Cultural Center of Hawaii, Honolulu, Hawaii
Nov. 6-12	2026 IAEM Annual Conference Long Beach, California

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