Domestic Preparedness Journal

Natural Hazards

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Mitigate the Impacts When Communities and Nature Collide

By Catherine L. Feinman

Natural hazards introduce potential dangers when naturally occurring environmental factors impact communities and the built environment. Wildfires, floods, hurricanes, earthquakes, public health threats, blizzards, ice storms, tornados, volcanos, and hail are just a few examples of hazards that can have devastating effects when they occur in populated areas. Emergency preparedness professionals plan for and try to mitigate such events, but nature is not always predictable. For example, La Niña and El Niño events do not occur at regular intervals. However, when they happen, they can significantly increase or decrease the frequency and severity of tropical rainfall patterns, leading to extremes such as flooding, drought, hurricanes, tornados, and wildfires.

Moisture changes in the atmosphere have even altered tornado and other storm patterns, pushing hazards into areas that are not typically prone to or prepared for them. In addition, events are not uniform across the country. When an extreme event happens in one area, the opposite extreme often occurs elsewhere – severe drought versus flooding and excessive rainfall, or heatwave versus a deep freeze. Since no two natural hazards and no two communities are identical, there are countless scenarios that could occur when the two collide.

Fortunately, communities across the country continually plan for these events to mitigate the possible effects. In this May edition of the *Domestic Preparedness Journal*, preparedness professionals from the West Coast to the East Coast describe past and potential future hazards and steps communities can take to mitigate their effects. By developing strategies, employing a unity of effort, educating the public, building situational awareness, addressing vulnerabilities, and understanding the psychological component, communities will be better positioned to withstand the forces of nature and minimize the potentially devastating effects. Since natural hazards do not respect human-defined boundaries, it is critical for communities to know how to best protect lives and properties when hazards share the space within those boundaries.

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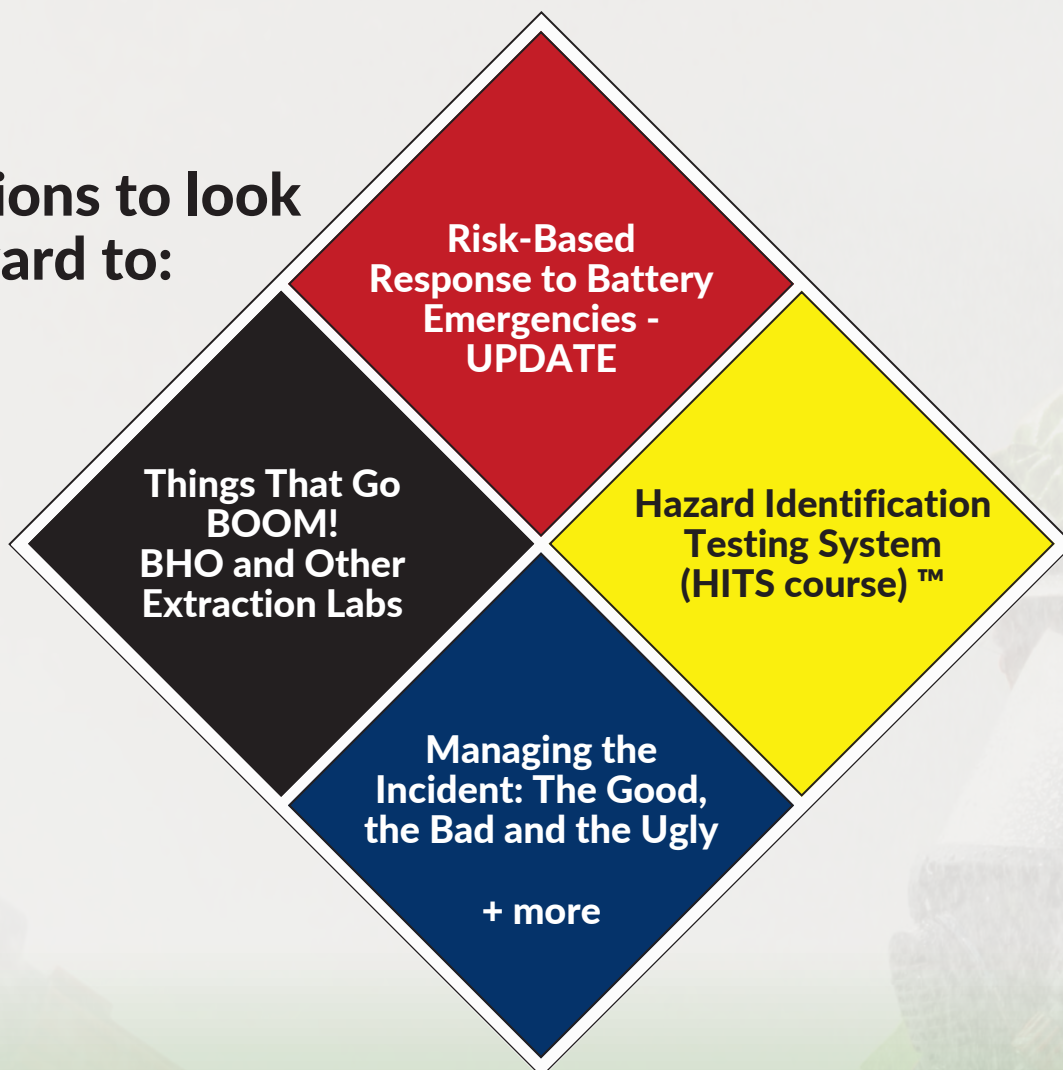
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Found along the Pacific Ring of Fire, Russia's Shiveluch Volcano began erupting on April 11, 2023. Huge ash clouds spewed from the main crater blanketing over 40,000 square miles (108,000 square kilometers) (*Source*: U.S. Geological Survey, 2023).

Navigating the Seismic Dance: Preparedness in the Ring of Fire

By Alicia Johnson

In the dynamic and often unpredictable theater of natural disasters, the Pacific Ring of Fire stands as a formidable protagonist. This extensive geographical belt, notorious for its seismic activity, encapsulates a broad spectrum of risk that commands attention, respect, and action. For community-centered organizations, the imperative is unequivocal to champion initiatives that ensure preparedness for the inevitable occurrence of earthquakes. It is critical to underscore the multifaceted nature of earthquake risks and delineate the indispensable role these organizations play in mitigating the impacts of such calamities through informative, equitable, and persuasive techniques.

Understanding the Unyielding Threat

The Pacific Ring of Fire, a moniker that evokes images of volatility and destruction, is not merely a geographic term but a constant reminder of humans' vulnerability to the earth's whims. It is here, amid this vast arc of tectonic boundaries, that the planet narrates its most tumultuous tales – tales of sudden shifts and catastrophic upheavals that have historically reshaped landscapes and human destinies.

The historical context of earthquakes within this fiery ring is a potent testament to their peril. Each seismic event, from the devastating 2001 Nisqually earthquake to the tragic Great East Japan Earthquake of 2011, narrates a story of loss, resilience, and the unyielding spirit of communities. These events do not merely represent statistical data; they embody the profound impact of natural forces on human lives, infrastructure, and economies. Within these narratives, the call for emergency preparedness finds its most compelling voice, urging community-centered organizations to lead with foresight and determination.

The Geological Tapestry and Its Implications

The Ring of Fire's geological complexity adds layers of risk that are as varied as they are challenging. Cities nestled within this volatile embrace confront a unique "seismic layer cake" – a term that aptly describes the intricate

stratification of soil and rock types, each with its implications for earthquake dynamics. In places like Seattle, Washington, the ground beneath harbors a precarious mix prone to liquefaction, transforming solid earth into a treacherous quagmire at the quake's onset.

Understanding these geological nuances is not an academic exercise but a critical component of effective disaster preparedness. Communities across the Ring of Fire must translate and educate why preparedness is so essential. By translating complex geological data into actionable knowledge, these entities can spearhead efforts to fortify infrastructures, inform communities, and advocate for policies that reflect the realities of living in high-risk zones.

Mount Etna "flank eruption" on December 24, 2018 (*Source*: USGS/Wikimedia Commons).

The Dual Hazard: Earthquakes and Tsunamis

The narrative of risk within the Ring of Fire is further complicated by the specter of tsunamis – gargantuan sea waves triggered by undersea earthquakes. This dual hazard scenario demands a comprehensive approach to preparedness encompassing both the immediate tremors and the potential following aquatic onslaught.

With their deep-rooted connections and authoritative voice, local governments and supporting community organizations are at the forefront of crafting and implementing integrated disaster preparedness strategies. Their work in educating the public, developing evacuation plans, and reinforcing infrastructure against tsunamis is invaluable.

The City of Padang, West Sumatra, Indonesia, is situated on one of the most tsunami-prone coastlines in the world. In response, the city government has implemented an extensive Tsunami Early Warning System and established clearly marked evacuation routes throughout the city. Furthermore, Padang conducts regular tsunami drills in schools and communities to enhance public awareness and preparedness for rapid evacuation when warnings are issued. Many cities along the West Coast of the United States engage in baseline evacuation messaging and signage, discussing with residents, businesses, and community-based organizations what alerts mean, how a tsunami behaves, and where to go during an evacuation. While these messages seem standard in these communities, the continuation of educating residents on their importance is nonetheless valuable. Communities like Bainbridge Island, Washington, actively practice, coordinate, and support each other in other mechanisms to ensure self-sufficiency.By addressing the dual threat head-on, these organizations safeguard lives and instill a sense of preparedness and strength within the community.

The Pivotal Role of Community Benefit Organizations

The call to action for community benefit organizations is clear and compelling. These entities are pillars of knowledge, leadership, and action in the face of seismic adversity. Their efforts transform the abstract concept of preparedness into tangible initiatives that enhance communities' safety and resilience.

Their work extends beyond mere advocacy; it involves a meticulous orchestration of resources, expertise, and community engagement to develop a culture of preparedness. From conducting drills and workshops to investing in resilient infrastructure and technology, these organizations personalize the preparedness narrative, making it relevant and actionable for every individual within the community. For many communities along the Ring of Fire, these community-centered organizations are the first line of response, while government organizations assess damage and attempt a quick and timely response.

Conclusion: A Unified Call to Action

As communities attempt to navigate the seismic dance of the Ring of Fire, the importance of emergency preparedness cannot be overstated. The stakes are invariably high, underscoring the need for informed, proactive measures to anticipate and mitigate earthquake impacts. Local governments and organizations that support the community on the ground are the vanguards in this endeavor, embodying the professional, confident approach required to galvanize communities toward greater safety and resilience. Connecting with those organizations – whether through volunteer service, incorporation into tabletop, functional, and full-scale exercises, or through other long-term contracting mechanisms – provides the opportunity for sustained relationship development. Those opportunities build resilience and serve the community over the long term.

In the face of nature's unpredictability, preparedness is the most potent weapon. It is a commitment to action, a pledge to safeguard, and a testament to the human spirit. It is critical to rally behind these organizations' efforts, supporting and amplifying their initiatives to build a future where communities are prepared for the inevitable and empowered to thrive in its aftermath. The call to action is clear: together, communities and their leaders must forge a path of readiness, resilience, and recovery. For in the dance with seismic forces, preparedness is, indeed, non-negotiable.

Alicia D. Johnson, MPA, is a highly accomplished emergency manager and the CEO of [Two Lynchpin Road](#)*. With over 20 years of experience in the public sector, she has a demonstrated track record of success in risk communications and public affairs. She uses human-centered principles to build collaborative relationships that protect the people and places we value. Her clients span local, state, federal, and non-profit partners in disaster management. Ms. Johnson has a wealth of experience in responding to several disasters and large-scale events, including the formidable Hurricane Sandy, the high-profile Super Bowl 50, the devastating 2017 Sonoma County Fires, and the COVID-19 pandemic. She regularly served as an Emergency Operations Center Manager and has held numerous positions within Incident Command Teams. Alicia holds Communications, Political Science, and Public Administration degrees from the University of Colorado.*

Shielding Communities: Public Health Strategies for Natural Hazards

By Raphael M. Barishansky and Andrew D. Pickett

As public health preparedness and response efforts evolved from their initial bioterrorism roots to take on an "all hazards" approach, the public health consequences of natural hazards have come fully into focus for governmental public health entities. The Federal Emergency Management Agency (FEMA) defines natural hazards as "environmental phenomena that have the potential to impact societies and the human environment," with some examples including hurricanes, earthquakes, tornados, and severe winter storms. FEMA's 2023 National Preparedness Report highlighted the nation's marked increase in the frequency, costs, and impacts of natural disasters over the past decade. These increased risks and the social and economic consequences continue to bring natural hazards to the forefront of public consciousness.

Understanding Public Health and Natural Hazards

Yet, when many think of the natural hazards that society may experience, responders and the public do not automatically consider the public health implications of these incidents. Public health factors are important considerations for responders to keep in mind, especially those in the health and medical sectors within the communities they affect. The public health impacts of natural disasters can fall into the following four general categories:

- Direct impact on the population's health,
- Direct impact on the health care system,
- Indirect effect on the population's health, and
- Indirect effect on the health care system.

Perhaps the most urgent potential negative influence from an emergency response perspective is the direct impact on the population. Individuals typically experience these public health impacts of natural disasters, including the physical injuries that require a health response. When researching the impact of earthquakes on public health, one January 2023 study found that the injuries typically experienced after natural disasters:

> [A]re mainly attributed to the partial or total collapse of buildings, movement of landslide material, generation of post-earthquake fires, physical impact with debris in fast-flowing tsunami water, and spill of hazardous chemicals. [The impacts] vary from minor cuts and bruises to serious fractures, crush injuries and burns. They also include airway obstruction or asphyxiation from the large quantities of dust and debris generated by collapsing buildings.

Additional complications from natural hazards are the potential for infectious diseases to develop and spread. These opportunistic illnesses may have direct or acute impacts, or they may have indirect or long-term effects on the population. The January 2023 study also found that, "although it is impossible to accurately predict which diseases would be transmitted after a certain type of natural hazard, infectious diseases can be categorized as either water-borne, air-borne, or vector-borne diseases," with primary or secondary causes such as contamination to open injuries.

Unfortunately, the challenges of public health response to these natural disasters can be most attributed to the funding that supports these responses. Public health is used to utilizing the CDC Public Health Emergency Preparedness system to fund its preparedness activities. However, this funding does not specifically call for any capabilities for natural disaster response. While CDC has implemented a Public Health Crisis Response funding mechanism to quickly provide support to state and local jurisdictions during a public health emergency, these natural disasters typically do not rise to a level that would trigger additional public health response funding. This means that public health (as well as health care) must rely on internal funding mechanisms or, in a significant event, funding through the FEMA public assistance program.

Public Health Response

Implementation of effective public health controls after a natural disaster begins with quick and thorough cleanup efforts. Public health controls, coupled with environmental health efforts, can positively impact the population. This includes ensuring access to safe food and drinking water in order to limit known disease vectors (i.e., rodents, insects), and offering appropriate medical interventions for injuries and acute illnesses. If all of these interventions are applied, they can be effective tools to mitigate the longer-term threats to the public's health.

An additional consideration after a natural disaster is the inherent impact on the delivery of public health and health care services. Power outages or infrastructure damage to facilities may reduce the availability and access to acute treatment at hospitals or urgent care facilities. Flooding that covers or washes away roads or other transit routes may impact the ability of emergency medical services (EMS) or public health officials to respond to locations where their services are needed. These factors may also affect the public health and health care workforce's connectedness to work sites, further limiting

their ability to provide essential services during a post-emergency situation.

Blueprint for Future Success

Planning for the public health implications of natural disasters must factor in the reality that the number of events, and severity of the resulting damage, have been increasing in recent years. The [Keck School of Medicine of the University of Southern California](#) suggests the following steps for developing an over-arching game plan: re-connect and retrain local and state-level agencies, develop and train contingency plans, include the new and the [so far] unforeseen events in emergency preparedness training, and understand the differences between sectors.

Re-Connect and Retrain Local and State-Level Agencies

"All disasters are local" in that they begin and end with the local governmental entities. But, as disasters unfold and it becomes apparent that local capabilities and capacities are not enough, the emergency response complexities can rapidly increase exponentially. Intra- and inter-agency coordination is critical for an organized, effective response to a regional or larger disaster. Yet the truth is still that, in practice, many localities may be disconnected from each other (and from the state and federal levels) in their approach to preparedness and response.

This disconnectedness is further complicated in the health sphere, as public health agencies may exist at different levels (e.g., town, city, county, region, state) than emergency management. For example, while municipal and county emergency management may have the authority to manage an emergency response, public health functions may be handled at the county or state level. Additionally, much health care exists within the private sector and typically serves a broader population

Source: [CDC](#)

Source: Omer Yildiz/Unsplash

than a single jurisdiction. Training is critical for emergency management and health workforces to identify weaknesses and teach agencies how to work seamlessly with each other. For example, the infamous failures in New Orleans after [Hurricane Katrina](#) could have been mitigated if there had been better inter-agency coordination between local and federal response teams.

Develop and Train Contingency Plans

To quote [Mike Tyson](#), "Everybody has a plan until they get punched in the face." It is safe

to say that many natural disasters can strike like a punch in the face. Ensuring that each level of government produces, maintains, and trains for contingency plans offers a significant advantage in the case of a real disaster if the first response approach does not work. [One common scenario](#) seen in the wake of a natural disaster involves:

> [T]ransportation lines being broken. Without a contingency plan addressing this risk, many agencies literally stop in their tracks, not knowing how else to proceed. This occurred in 2010, in Haiti, when the main road from the international airport was destroyed after a major earthquake hit.

Include the New and the [So Far] Unforseen Events in Emergency Preparedness Training

One of the more well-known mantras about emergency planning (compliments of [General George Patton](#)) is "train like you fight, and fight like you train." As the emergency threat landscape continues to change and evolve, preparedness training must provide for new challenges – the "what ifs" of any scenario. The events impacting a specific area of the world can become infinitely more complicated if floodwater, rain, or heat suddenly inundates the region. Contingency planning must anticipate the unexpected and prepare in advance for possible solutions. In addition to what participants generally expect, exercises should cover extreme examples beyond what is probable to include what is possible (e.g., Fukushima).

Understand the Differences Between Sectors

During the COVID-19 response, tension between emergency management and public health officials over roles and responsibilities was reported in multiple settings, which was

summarized in <u>this report</u>. The approach by public health was often too slow, too mired in data and analysis, and not responsive to the emergency at hand. On the other hand, emergency management sometimes was seen as not fully understanding the logistics and other realities of a public health emergency response. All parties in a response should explore and understand the cultural differences, response capabilities, and capacity between communities before an incident. While organizational culture is unlikely to have significant shifts, these understandings can help smooth the relationships during a response.

Implementing a Strategy

There is nothing new about natural hazards and the public health risks they present to communities and emergency responders.

However, increases in the scale of and needs during these events are new due to increased frequency and larger population sizes. As outlined above, these increases bring with them public health planning and response challenges as well as the potential to implement public health lessons learned from previous natural hazard responses in future responses.

Public health challenges during natural hazards are complex and demand thorough planning, coordination, and response strategies among all disciplines to mitigate their impacts on affected populations. Addressing these challenges calls for public health and emergency management personnel to have a mutual understanding of the risks and hazards associated with natural hazards response, as well as the authorities and the capabilities within and between communities to address them.

Raphael M. Barishansky, DrPH, is a public health and emergency medical services (EMS) leader with more than 30 years of experience in a variety of systems and agencies in positions of increasing responsibility. Currently, he is a consultant providing his unique perspective and multi-faceted public health and EMS expertise to various organizations. His most recent position prior to this was as the Deputy Secretary for Health Preparedness and Community Protection at the Pennsylvania Department of Health, a role he recently left after several years. Mr. Barishansky recently completed a Doctorate in Public Health (DrPH) at the Fairbanks School of Public Health at Indiana University. He holds a Bachelor of Arts degree from Touro College, a Master of Public Health degree from New York Medical College, and a Master of Science in Homeland Security Studies from Long Island University. His publications have appeared in various trade and academic journals, and he is a frequent presenter at various state, national, and international conferences.

Andrew D. Pickett, MS, is a public health and health care emergency preparedness and response leader with over 15 years of experience in local and state government roles.

A Critical Imperative for Natural Hazards

By Sandra Dennis-Essig

With a sharp growth in the number and size of natural hazards across the globe, communities worldwide have experienced destruction from numerous natural hazard events – including deadly forest fires, exceptional flooding, severe hurricanes, and droughts. Mitigation of the effects of these hazards requires overall and comprehensive preparedness in intricate interrelations of physical, social, economic, and environmental factors to withstand, adapt, and recover from the shocks and stresses imposed by natural hazards.

Improving overall preparedness includes physical infrastructure and emergency response systems that address the communities' social fabric, economic stability, and environmental sustainability. Therefore, community leaders and those in emergency preparedness roles must take a holistic approach to enhance preparedness, develop collaboration, and cultivate resilience for negotiating the challenges of increasingly volatile natural events.

Develop Robust Strategies

Community resilience is a multi-dimensional concept describing the ability of a community to resist, recover from, and ultimately reduce the adverse impacts of hazards to set the stage to manage future hazards and learn from experiences. Physical, social, economic, and environmental components are critical for comprehensive community resilience building:

- *Physical* – This component includes infrastructure, buildings, and emergency response systems. Measures like disaster-resilient construction, critical facility reinforcement, and a well-coordinated emergency plan help reduce physical damage and ensure preparedness.

- *Social* – Strong social networks, engagement, and access to resources among communities ensure social resilience and expanded capacity to strive together and recover.

- *Economic* – Resilient economies have diversified local economies, financial soundness, and business continuity planning. These economies keep critical economic activities operational, support small businesses, and diversify all types of companies to avoid financial consequences related to natural hazards.

- *Environmental* – Environmental resilience is possible through the sustainable use of natural resources,

preservation of ecosystems, and adaptation measures.

For example, after the 2011 earthquake and tsunami, Japan invested heavily in disaster-resilient infrastructure and programs of community training. These vital components are intrinsically interlinked and, when treated holistically, can treat their interdependencies. Environmental conservation boosts social resilience by preserving natural resources for communities, whereas economic resources support physical resilience by building infrastructure. Using a holistic approach helps communities prepare for natural disasters.

Fortify the Physical Foundation

Building codes and more robust standards, per the International Code Council, center around becoming disaster-resistant to substantially reduce damage and losses. Indeed, studies show that for every $1 invested in hazard-resistant building codes, communities will save $11 in future disaster costs, as does a high level of fortification of key infrastructure, such as the modernization of power grids, water systems, and communication networks. According to the 2021 Infrastructure Report Card, the American Society of Civil Engineers estimates that the 10-year investment gap has increased from $2.1 trillion to $2.59 trillion since its 2017 report.

Build Social Solidarity

Community involvement through workshops, training, and public events stimulate awareness and empowerment among residents. For example, the Federal Emergency Management Agency's Community Emergency Response Team (CERT) program, in over 2,700 communities, has trained almost 600,000 volunteers in disaster preparedness and response. Active dissemination of risk through various channels and in several languages is another crucial factor, primarily for vulnerable

groups. Similarly, neighborhood support networks, like the Citizens Protecting Citizens program in St. Louis, Missouri, train residents in emergency protocols.

Strengthen the Economic Core

Making local industry multifaceted can help avoid one sector's inflexibility. The 2008 global economic crisis highlighted Detroit, Michigan's overdependence on the car industry, prompting the city to seek to attract technological and health service companies. Small business continuity planning with assistance from the city government for local businesses is crucial. When a small business fails, its service industry fails, too. However, jobs can reduce psychological and other escalating disaster effects by providing a sense of purpose and meaning, offering a stable routine and structure, and creating opportunities for social support and connection, among other benefits.

Protect the Environmental Balance

Water-saving practices, renewable energy, and green infrastructure projects increase environmental resilience. In 2018, The Guardian reported that a water rationing plan was ready for a so-called Day Zero in the arid City of Cape Town, South Africa, where taps began running dry. Conservation of resources, such as wetlands and forests, which provide roughly $24 billion a year in flood reduction and storm protection in the U.S., is of prime importance. Adaptation strategies, such as the one for Boston, Massachusetts, Resilient Harbor Vision, prepare cities for future impacts of changes such as rising seas, hotter summers, and flooding from the coast. They accomplish this by community engagement and long-term urban planning.

An Integrated, Collaborative Approach

When combined into a comprehensive strategy established in close consultation with the community, these techniques perform at their highest level of effectiveness. A shared commitment and sense of ownership can pay long-term dividends in building strong communities. Good examples include communities that focus on engaging residents, businesses, government, and community organizations in risk assessments, preparedness goals, and tailored action strategies. For example, after a 6.3-magnitude earthquake in 2011, **Christchurch, New Zealand,** embarked on an extensive rebuilding process involving wide community engagement. The city founded the "Share an Idea" campaign that allowed residents to offer their visions and thoughts on how to redesign the city. This action led to a community-driven recovery strategy that focused on strengthening the infrastructure and the resilience of the community.

Foster Partnerships and Collaboration

In a complex and interconnected world, building disaster resilience in the local community becomes a priority to create stronger communities that are capable of rising from the more significant hazards that nature delivers. It is achievable by establishing alliances and joint participation. For example:

- Developing a community's capacity to withstand adversity is a challenging endeavor requiring broad stakeholder participation. Partnerships and collaboration appreciate collective resources, skills, and talents in tackling natural hazard concerns.

- Local governments strengthen partnerships with their constituents,

Source: NASA/Unsplash

emergency management agencies, community organizations, businesses, academic institutions, and residents.

- The key benefits of collaborative practice are evident when emergency management agencies offer disaster preparation and response expertise, while community organizations share information about different populations' needs and vulnerabilities.

- A coordinated response understands the need for effective communication and coordination mechanisms when
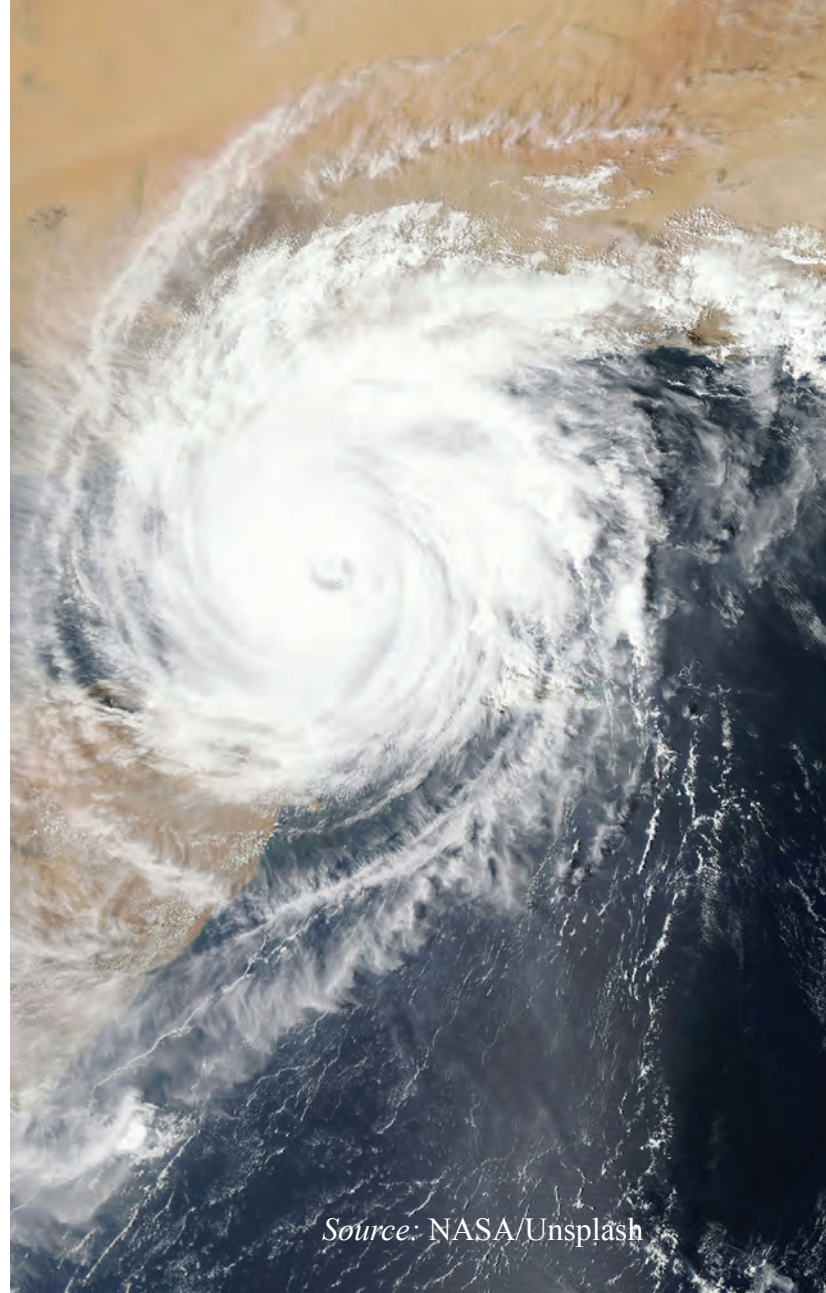
Source: Lucy Chian/Unsplash

addressing or mitigating natural hazards. This coordination is achievable by establishing joint command centers, unified communication protocols, and integrated information-sharing platforms.

- Collaboration brings a sense of shared responsibility and ownership among stakeholders, which builds their commitment. Working together, communities can define existing gaps, complement their assets, and develop strategies to address these gaps in physical, social, economic, and environmental dimensions.

Communities become better equipped to deal with increasing disasters when they adopt a comprehensive and pragmatic disaster preparedness program. Such a comprehensive guide would address vulnerabilities when it addresses the complexities of the physical environment, human society, and economic and environmental systems. Stakeholders would make concerted efforts to coordinate the energy, knowledge, and potential of everyone involved, which would not be successful in seclusion. People, organizations, and the government acting together and decisively would understand their responsibility in building resilience now.

Build Resilience in the Face of Natural Hazard

This critical call to action for building resilience in the face of natural hazards involves a comprehensive approach, starting with risk assessments, emergency planning, infrastructure protection, preparedness, collaboration, ongoing mitigation, robust response, learning from past disasters, community engagement, deploying technology and innovation, and long-term recovery

planning. Communities should consider taking the following steps immediately:

- Conduct a thorough risk assessment to identify areas of high risk and prioritize mitigation efforts;

- Develop a comprehensive emergency plan that includes evacuation routes, shelter locations, and communication strategies;

- Invest in infrastructure designed to withstand natural hazards and ongoing repairs;

- Foster a culture of preparedness and educate residents on the risks associated with natural and other hazards;

- Engage with local organizations, businesses, and government agencies to leverage resources and expertise;

- Conduct pre-disaster exercises and post-disaster assessments, and incorporate lessons learned into updating emergency plan

and expanding resilience-building efforts; and

- Develop long-term recovery plans tailored to the specific needs of the community.

The increasing frequency and severity of natural hazards globally demand a proactive and integrated approach to disaster preparedness and resilience. Natural disasters are a persistent reality, and significant events can cause immediate and enduring adverse impacts on individuals, societies, and economies' physical and mental health, social fabric, and financial stability. By adopting a comprehensive strategy encompassing physical, social, economic, and environmental components, communities can significantly enhance their ability to withstand and recover from natural disasters. Community resilience is essential. We should work together to mitigate the destructive effects of natural disasters and ensure our communities' long-term welfare and stability.

Sandra Dennis-Essig is a dedicated professional with a strong background in emergency management. She is a graduate of the Federal Emergency Management Agency (FEMA) National Emergency Management Basic Academy, the Emergency Management Project (Class #25). She holds certificates from FEMA/Department of Homeland Security, Cybersecurity and Infrastructure Security Agency, National Nuclear Security Administration/Nuclear Forensics Operations, Counterterrorism Operations Support, the Texas A&M Engineering Extension Services Infrastructure Disaster Management Certificate Program, and the National Disaster Preparedness Training Center. Sandra serves as a decontamination team member with a patient decontamination team in San Diego, California, and as a disaster duty officer for the American Red Cross in San Diego and Imperial County. She has collaborated with the New Jersey Human Trafficking Coalition as an advocate, speaker, and survivor. Sandra currently serves as a selected service board member for the State of California and previously served as a volunteer selected services board member for the State of New Jersey.

Elegant Community Preparation

By Aaron Titus
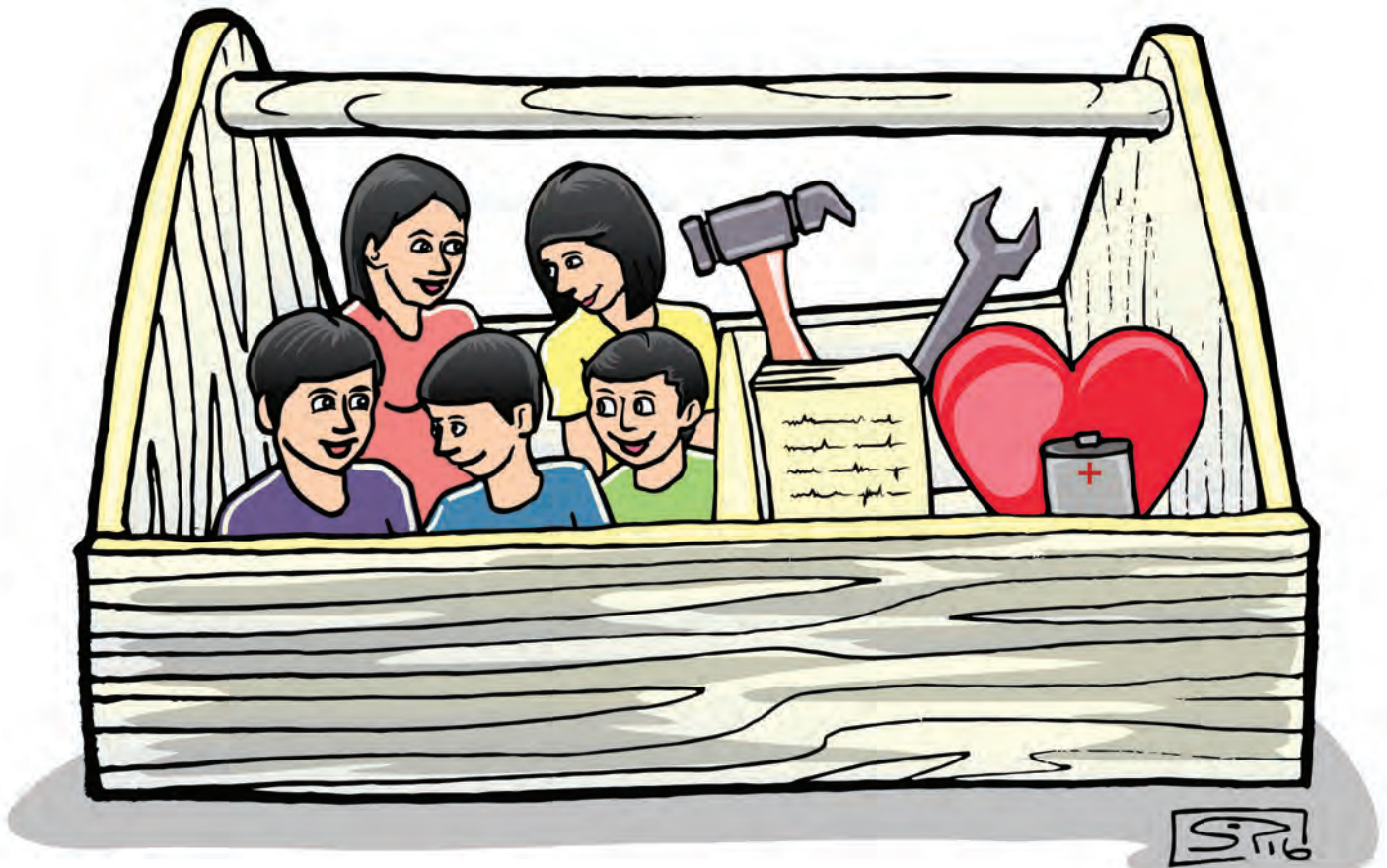
Are preparation trainings simple or elegant? Simplicity and elegance may seem similar, but they handle complexity differently. Simple solutions place a burden on the end user. In contrast, elegant solutions internalize complexity away from the end user. For example, compare a telegraph with a telephone. A telegraph is a simple circuit over a wire, yet using a telegraph is complex because users must know Morse code. Users can only communicate one-on-one within a certain distance. Telegraphs have no voicemail. The telegraph may be simple, but using it is complex.

In contrast, a telephone is elegant. Using a 12-number dial pad, users can talk with almost anyone across the globe. However, the systems that run telephone exchanges are exceedingly complex. Because they internalize complexity, the phone is elegant. Other examples of externalizing complexity (simple) versus internalizing it (elegant) include:

- A hand saw versus a chainsaw,
- A mid-nineties GeoCities website versus a modern search engine, and
- Pencil and paper versus a calculator.

The Complexity of Preparation

Too often, preparation is taught simply, which overwhelms students. Small differences between neighbors in family situations, health, pets, etc. require radically different solutions. There are more ways to prepare than there are atoms in the universe. Many studies, including one published in 2019 by the Federal Emergency Management Agency, acknowledge that communities often are not fully prepared. After decades of work, preparation remains complex because communities frequently use simple instead of elegant solutions. However, I propose

a simple process that can internalize the complexity and make preparation elegant.

To begin the process, group preparation factors into three categories: preference, familiar, and novel factors.

Preference Factors

Preference factors are subjective qualities of individuals, families, and communities. They are not objectively measurable, and experts cannot account for them when teaching others. For example, indoor plumbing might be optional for someone, while access to high-speed internet is non-negotiable. Preference factors include:

- Risk tolerance,
- Degree of comfort required,
- Priority of resilience, and
- Problem-solving style.

Familiar Factors

Familiar factors are objective aspects of a person's daily experience. These can be so familiar that they may be second nature or common knowledge, such as a person's native language, nationality, family size, health, and living conditions. For example, familiar factors for an elderly Spanish-speaking widow in poor health, living on the 34th floor of a Manhattan apartment building with a small dog, would have a considerable effect on how she prepares. A young family living in a suburb prepares very differently. However, familiar factors are so second nature that a person does not need to think about them consciously. Experts who try to account for familiar factors risk coming across as condescending. Familiar factors include:

- Environment, location, and geopolitical conditions;
- Cultural and religious influences;
- Baseline access to resources;

- Living situations and conditions;
- Health;
- Season-specific needs;
- Coping strategies and solutions; and
- Likelihood of a disaster occurring.

Novel Factors

Novel factors, such as disaster type and extent, are also objective but not a part of daily experience. For example, a tornado has objective attributes, such as wind speed and scope of damage. However, because most people do not encounter tornadoes regularly, they are not familiar enough to intuitively understand their power, nor how these factors should influence their preparation. Consequently, factors like the type, extent, and duration of a disaster are novel. Because of their unfamiliar nature, novel factors may cause more fear, uncertainty, and doubt than preference or familiar factors. Novel factors include:

- Type of disaster,
- Extent of disaster,
- Disruptions to resources,
- Duration of disruptions, and
- Motivation to act.

A minor change in preference, familiar, and novel factors can completely change a person's preparedness strategies. With countless combinations of these factors, preparation can be extremely complex, with each person preparing differently.

Some current practices of high-level principles may be too abstract to be actionable, checklists can be overwhelming, and hazard-specific preparation continues endlessly. Doomsday preparation may create more heat than light. It is well-documented that too much focus on disasters can have adverse effects that make people question what to do and how to react when a disaster occurs. An elegant approach offers individuals and communities the tools to solve problems and organize what they already know, thus overcoming the preparedness overload.

Tools to Help Prepare for Everything

Preparing for everything can be broken into two components: First, prepare for disruptions, rather than disasters. Second, prepare together as communities.

Social connections are more important to both survivability and resilience than any other single factor. In July 1995, a short but intense heat wave crippled Chicago; 739 people died in Chicago's deadliest event in history. Sociologist Eric Klinenberg analyzed who died and why. Latinos, who made up 25 percent of the city's population, represented only two percent of the fatalities. Because this group tended to be poorer and sicker than the general population, sociologists expected they would fare worse than average, not better. Instead, their Black and white counterparts died at much higher rates.

With apologies to Eric Klinenberg for simplifying his ground-breaking research, people with better social connections fared better. Researchers found that the Latino community has a culture of strong family values, vibrant public spaces, and a lively commercial street life. This culture promoted social and family ties, which meant that fewer elderly Latino residents were forgotten. In contrast, other groups' social ties were not as solid. Elderly residents who lived in thinned-out neighborhoods with little street life were less able to maintain family and social connections.

Even in the most vulnerable communities, most people do not need experts to help them meet their daily needs or navigate

their daily lives: <u>0.2% of the U.S. population is homeless</u>; <u>11% are food insecure</u>; and less than 3% need <u>rental assistance</u>. These numbers are, of course, serious. But they also mean that the majority of the population are preparation experts because they know how to meet their daily needs and are already doing so. They are more likely to lack a way to organize what they already know, which can have life-threatening effects when a novel factor is introduced.

Community leaders accustomed to creating lectures, programs, and pamphlets must first realize that residents are experts on their own communities and capacities. Instead of

Disruptions Caused by Disasters	Power & Computer	Water, Sewer & Sanitation	Shelter & Property	Evacuation	Physical Safety	Communication	Food & Cooking	Medical	Transportation & Fuel	Heat & Cooling	Money/Finance	Legal Problems	Important Documents	Emotional & Spiritual Needs
External Regional Disasters														
Add another														
Hurricane or Earthquake	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pandemic					X			X			X			X
Ice Storm	X	X	X		X	X	X		X	X				
Biological Incident		X		X	X	X		X	X					X
Financial Recession			X					X			X	X		X
Tornado	X	X	X	X	X	X	X	X	X	X	X	X	X	X
External Local Disasters														
Add another														
Civil Unrest			X	X	X	X		X	X		X	X	X	X
Community Shooting				X	X	X								X
Water Main Break		X	X	X			X				X	X		
Flood	X	X	X	X	X	X	X		X	X	X	X	X	X
Major Road Construction							X		X					
Toxic Gas Release				X	X			X	X	X				X
Personal and Family Disasters														
Add another														
House Fire	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Death of Spouse or Child			X				X				X	X		X
Unemployment			X				X		X		X	X		X
Chronic Illness									X		X	X		X
Divorce			X								X	X		X
Domestic Violence				X	X			X			X	X		X

Table 1. Disruptions caused by various disasters, emergencies, and stresses (*Source*: Aaron Titus, 2024).

experts telling them what to do, facilitators could help create a collaborative learning environment of mutual respect to prepare for "disruptions," which in turn prepares them for any disaster.

Facilitators would facilitate discussions rather than lectures because participants can account for their own familiar and preference factors. That leaves the novel factors, including the type and extent of disaster, resource disruptions, and motivation to act. Converting disasters into disruptions neutralizes the fear, uncertainty, and doubt of novel factors. Table one illustrates various disasters and the disruptions they are likely to cause. Please note that each "X" is illustrative and is not meant to be definitive. The reader may add or subtract Xs as they feel comfortable.

The left column of Table 1 contains two novel factors, an abbreviated list of disasters

(i.e., type of disaster) grouped by external regional, external local, and personal and family (i.e., extent). The top row includes another novel factor: disruptions to resources (or basic human needs). The grid indicates that some disasters, like chronic illnesses, would probably not disrupt shelter. Others, like a flood, can cause disruptions across the board.

Individuals have little control over most disasters, or they would ensure bad things never happen. However, translating disasters into disruptions can transform the fear, uncertainty, and doubt of disasters into a tool of empowerment. For example, turn Table 1 ninety degrees so the disruptions are on the side, and the disasters are on the top. Reading the grid this way, it is apparent that preparing for a power outage partially prepares for house fires, floods, tornados, ice storms,

Disruption: _____
0 Hrs → 3 Days → 2 Weeks → 1 Month → 6 Months *External Disasters* ←→ *Family and Personal Disasters*
72-hour kit
Support System / **Dates Reviewed**

Table 2. Brainstorm coping strategies and solutions as a community (*Source:* Aaron Titus, 2024).

hurricanes, and earthquakes. Likewise, preparing for a disruption to emotional and spiritual needs partially prepares for many of the disasters on the list. Preparing for a few disruptions can prepare someone for any disaster. Unlike disasters, individuals have considerable power over how they respond to the disruptions they cause. This change in perspective (or simply rotating the table) motivates residents to leave negative novel factors behind and act.

That leaves just two novel factors: disruptions to resources and duration of disruptions, which Table 2 addresses. This example of a facilitator worksheet can help residents brainstorm coping strategies and solutions.
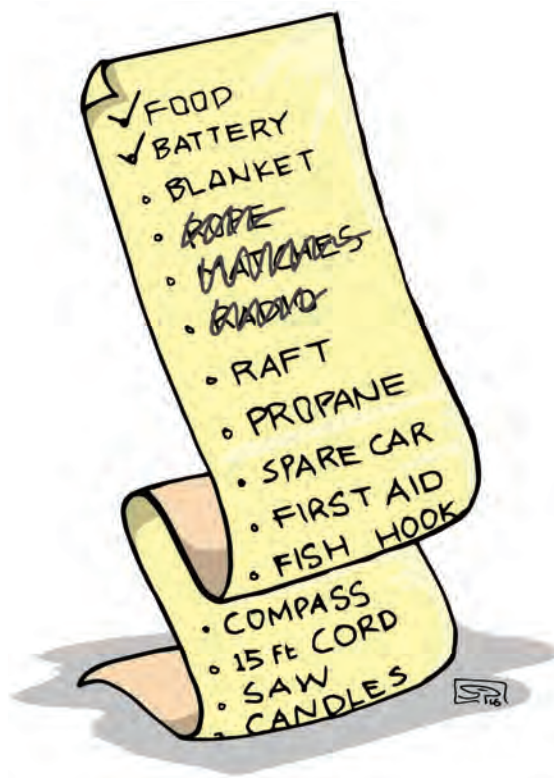
Prepare Together

Elegant community preparation involves preparing together. Based on more than 100 years of disaster sociology, social connections are more important to survivability and resilience than 72-hour kits or working infrastructure. Preparing together is an act of resilience. Learning from one another and strengthening community connections, rather than listening to a lecture, is an indispensable component of preparation:

- Gather a community group, friends, or family.
- Facilitate a discussion where participants brainstorm solutions for each disruption.

©Aaron Titus (2017), reprinted with permission.

- As others share ideas, have participants write down strategies that work for them; ignore ideas that do not work.
- Do not lecture.

Preparing together offers communities appropriate solutions, stronger relationships, and a more complete plan. The approach can work within any community – in cities, suburbs, rural communities, mountain towns, etc. Communities should prepare for disruptions together to elegantly prepare for everything. Equally important, they should analyze other programs and ask: Are they simple or elegant?

Aaron Titus is the executive director for Crisis Cleanup. This disaster relief collaboration platform has documented $1.8 billion of volunteer service by 2,600 organizations after more than 230 disasters in 48 states and 7 countries. He is the past president of Mountain West Voluntary Organizations Active in Disasters (VOAD), a 13-state coalition of relief organizations, the founding chair of the Boulder County Long Term Recovery Group (Marshall ROC), serves as the co-chair of Boulder County VOAD and serves as an officer in Colorado VOAD. Aaron is the author of "How to Prepare for Everything" and facilitates workshops across the country. Aaron received his J.D. from the George Washington School of Law and his undergraduate in Architecture from the University of Utah.

The Psychology of Crisis
By Mary Schoenfeldt

A crisis can be described as unpredictable and often sudden. It can be life-threatening and life-changing, which creates a high level of uncertainty and leaves people feeling out of control and overwhelmed. Some crises can be almost universal, with many people having similar experiences – for example, the COVID-19 pandemic, a significant incident with loss of life, a foreign or domestic terrorist attack, or a system collapse such as the financial infrastructure.

A crisis can also be personal, such as a car accident, a sudden death of a family member, a job loss, or other life disruptive event. Whether it affects many people or is personal, there are predictable elements to crisis and the psychology behind how and why people react. By knowing how to define a crisis, why people react the way they do, and how to manage it, people can mitigate their reactions and lessen the time they feel overwhelmed and out of control.

Behavioral Reaction Phases

The psychological response to a crisis is eerily predictable and can be anticipated, whether exploring it from a personal or a professional perspective. There is a pattern of behavioral and psychological reactions.

Pre-Disaster Phase

Start by thinking about a typical day in the regular pattern of life, which can be called pre-crisis or pre-disaster. For a natural disaster, there might be a warning that something is coming. The warning spurs attention to new information that may have an impact. When new information arrives, people can either hear it or ignore it, but, on some level, they react to it. When that warning becomes a real threat, the senses become alert, and people respond to both the threat and the impact.

Whether there is a warning or not, at this point, the personal senses are both sharpened and muted due to the physiological response

of survival chemicals being released into the body to impact thoughts, feelings, actions, and senses. This response affects heart rate, digestion, vision, actions, memory, judgment, critical thinking skills, and more – often called the fight, flight, or freeze reaction.

Sometimes, reactions are easy to identify. At other times, they may be less noticeable, even when they are happening. For example, imagine being handed a note that says to call home because of an emergency, and the phone number or even where the phone is slips the mind. In a different crisis, the reaction could be much more extreme, including not reacting at all (shock), or a spontaneous action such as running into the incident without thought to personal safety.
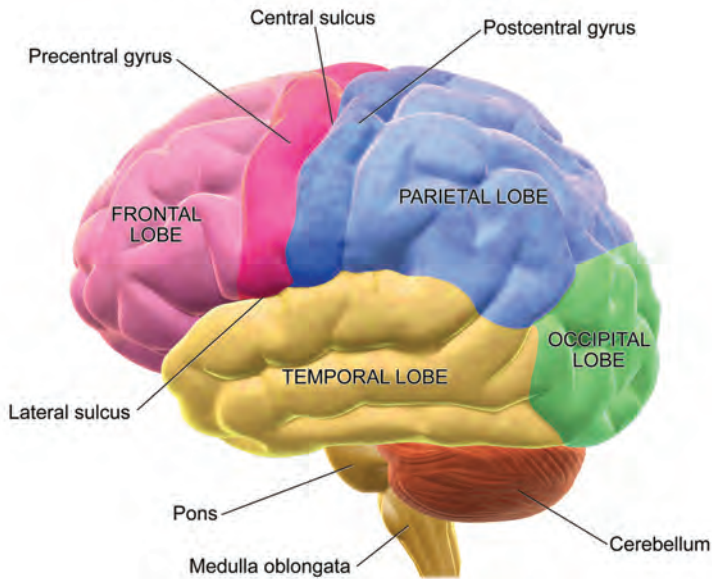
Heroic Phase

The next set of predictable reactions includes being able to take control and manage an immediate situation even when it is
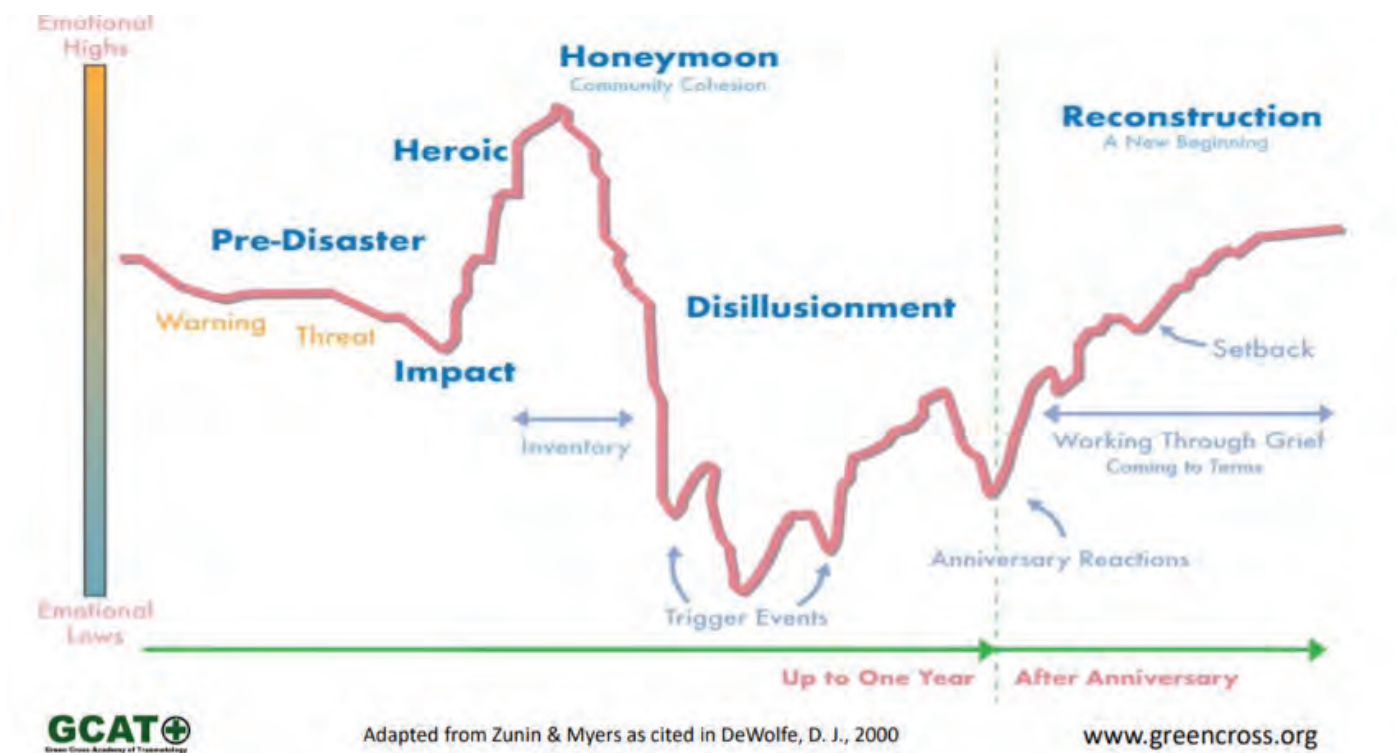
Source: Green Cross Academy of Traumatology (GCAT), reprinted with permission.

Lateral View of the Brain

As brain science research advanced, it became apparent that reactions are not simply emotional but physiological as well (*Source:* Bruce Blaus, CC BY 3.0, via Wikimedia Commons).

challenging to imagine doing. Physical strength may increase, which is evident in cases where someone has picked up a car to rescue a stranger who was trapped. Sometimes, families come together in ways they never have before or discover new ways of short-term coping. Efforts such as Boston Strong illustrate this result by recognizing survival and forming community coalitions. When communities unite, it breaks the sense of isolation and vulnerability that can be present in many individuals. During these times, there can be a sense of euphoria and thoughts that anything can be manageable!

Disillusionment Phase

Unfortunately, the Heroic Phase soon gives way to the Disillusionment Phase. There can be a steep dive into darker emotions and behaviors from here. Anger, frustration, blame, and depression are not uncommon. With regard to the COVID-19 pandemic,

this phase included people going to their government state houses, angry that officials were asking them to wear masks. Some areas also saw intense civil unrest in this phase of the global crisis.

Reconstruction Phase

Eventually, people adjust and climb back up that emotional ladder to something more comfortable as this new way of being becomes more familiar. Normal is a word that tends to be overused and, in many ways, is inaccurate. It is impossible to travel back to yesterday or the moment before the crisis occurred, so people should not define "normal" in such terms. Normal is just a setting on a dryer! The universe shifted with the crisis, life changed and what was will not be the same again. If that is the gauge, it is a set-up for failure. The genuine desire is to be comfortable again, which requires familiarity and the passing of time.

There will be ups and downs as different trigger events happen moving forward. However, the slow climb brings people to a place of less intense emotion and reaction over time. The time for this to happen, though, can be months or even years for some crises and some people.

Psychological and Physiological Reactions

Taking the psychology of a crisis into consideration, emergency preparedness professionals need to understand and acknowledge that during a crisis, people in the community may:

- Take in information differently,
- Process information differently,
- Act on information differently,
- Cannot fully hear because they are juggling multiple facts,

- Are not remembering facts as they usually would, and
- Can misinterpret action messages.

Initially, people can believe the crisis is so large and overwhelming that it creates a feeling of hopelessness and helplessness. There may not seem to be anything anyone can do about it. Hopelessness and helplessness lead to a sense of lack of control that then leads to vulnerability. Add conflicting information or lack of information, which can increase anxiety and emotional distress, and people can become confused, angry, and uncooperative.

As people move through the psychological and physiological response to a crisis, they will get to the stage where they experience relief, recovery, and reorganization. A sense of strength and empowerment can give a new understanding of risk and risk management, add new skills and resources that can manifest as a renewed sense of community, and open new opportunities for growth and renewal. All of this can lead to what is called post-traumatic growth – *post* meaning after and *traumatic* meaning a crisis. *Growth* refers to emerging with new skills and a more profound understanding and appreciation. However, it does not come quickly or easily.

A Critical Role for Leaders and Influencers

Leaders and influencers have an important role in crisis management for themselves,

Normal is just a setting on a dryer (*Source:* PlanetCare/Unsplash).

their families, and their organizations. Those around them will be looking to them for guidance and direction. By understanding the pattern of the crisis itself, leaders and influencers are better able to anticipate reactions and provide needed reassurance. Understanding the psychology of crisis, including the predictable phases and patterns, makes it easier to understand and take appropriate steps or actions to help move through the crisis and mitigate its impact. Crisis is inevitable, but understanding the psychology involved makes it much more manageable.

Mary Schoenfeldt, Ph.D., is the board president of Green Cross Academy of Traumatology and has responded to countless disasters. She is an emergency management professional specializing in community and school crises and has a passion for disaster psychology. She is a faculty member of FEMA Emergency Management Institute, an adjunct faculty at Pierce College, and a subject matter expert for the U.S. Department of Education. She also serves clients through her consulting business. She can be reached at yoursafeplace@msn.com

Unified command observes Key Bridge cleanup efforts in Baltimore, Maryland, on April 6, 2024 (*Source*: Dylan Burnell/U.S. Army Corps of Engineers).

Key Bridge Collapse: Unity of Effort

By Michael Prasad

The National Incident Management System includes unity of effort as one of its guiding principles. It is easy to spot in after-action reports when it is *not* in place on a large-scale incident. However, the opposite seems to be true for the Francis Scott Key Bridge Collapse response and recovery work in Baltimore, Maryland. Unity of effort has been apparent – from the bridge collapse and death of six workers on March 26, 2024, to the ongoing environmental and economic restoration of business in and around the port and channel.

Different Goals, Same Key Objectives

Incident command includes leading more than just a massive operations section. The general staff leads and the other elements of the command team (safety officer, liaison officers, and public information officer) were activated for this incident. The U.S. Coast Guard organizes using a general unity of effort model in its civilian support operations for disasters (see Figure 1) to work together while maintaining jurisdictional responsibilities and authority. An acronym the author uses as a mnemonic for organizing the command structure is IFLOPI (Incident Command, Finance and Administration, Logistics, Operations, Planning, and Intelligence).

The incident response to this bridge collapse undoubtedly includes varying objectives and competing agendas regarding who will ultimately face financial or other consequences. However, a commander's intent often follows the priorities of life safety, incident stabilization, property and asset protection, environmental and economic restoration, and recovery and resiliency in the long term, which can be remembered with another one of the author's mnemonics LIPER. The first part of this acronym – the LIP – originates in the fire service. This mnemonic can help command staff keep their priorities straight, which is especially important for complex incidents like the Key Bridge collapse. Unity of effort is critical in this scenario because moving piece A of the bridge might disturb piece B, which could damage the ship further or endanger divers below.

Incident Command

The incident command for the Key Bridge operation comprises a lead federal coordinating officer, a deputy coordinator, a safety officer, a public information officer leading a joint information center (or JIC), and several liaison officer positions. For example, the National Oceanic and Atmospheric Administration National Weather Service's Eastern Regional

ORGANIZATIONAL GUIDES

<u>INCIDENT COMMAND SYSTEM ORGANIZATION CHART</u>
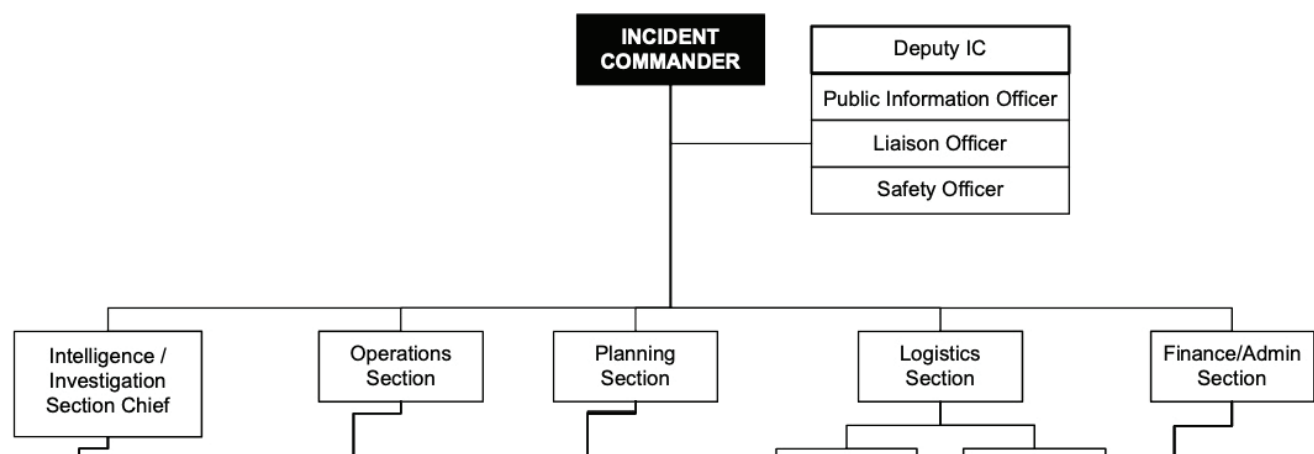
Fig. 1. Incident Command System Organization Chart (*Source:* <u>U.S. Coast Guard</u>, p. 13.1).

Operations Center supports the unified command with weather intelligence from its Bohemia, New York office. The JIC has produced almost daily reports, which anyone can subscribe to, and consolidated public-facing information on a unique open-source website: https://www.keybridgeresponse2024.com/. Other groups providing liaison support to unified command, as of this publication, include the U.S. Environmental Protection Agency, Occupational Safety and Health Administration, National Transportation Safety Board, U.S. Customs and Border Protection, Federal Bureau of Investigation, U.S. Naval Sea Systems Command's Supervisor of Salvage and Diving, Maryland Port Authority, National Resource Police, Baltimore City, Baltimore County, Anne Arundel County, Cyber Security & Information Security Agency, Maryland Emergency Management, Pipeline & Hazardous Material Safety Administration, Environmental Protection Agency, and Seaman's Church.

Finance and Administration

Many personnel and expensive equipment resources from different agencies, departments, organizations, etc., are involved in this response and recovery operation. One significant difference between *regular* business or governmental management and *emergency* management is the idea of budgeted costs. A typical corporate or governmental project starts with a finite budget and builds capacity and results from there. In emergency management, it is the opposite. The required results and the capacity needed to get there are the key metrics or drivers – and then the tabulation, documentation, and quantification of expenses. Cost cannot and should not be a primary limiting factor when making decisions during a disaster response. The Key Bridge collapse response and recovery work is being funded by a combination of public and private funding, and does not qualify for Stafford Act funding via the Federal Emergency Management Agency (FEMA).

Logistics

There is undoubtedly a unity of effort for logistical support for the bridge collapse incident. As with any large-scale event, logistical elements need unified coordination. This incident has land, water, and underwater transportation needs to bring the workforce back and forth to the scene and remove massive amounts of debris to an offsite location. For example, it takes unity of effort to organize the tenders that carry divers and investigators to the *DALI*. This effort also coordinates with engineers using advanced underwater light detection and radar (LIDAR) to map wreckage locations for fatality recovery, clear the channel for ship traffic, and support unique equipment to lift large bridge sections from the water onto barges. As of May 2024, the response has become primarily a logistics-led operation. The U.S. Army Corps of Engineers estimates there were more than 50,000 tons (45,359 mt) of steel and concrete that collapsed into the Patapsco River.
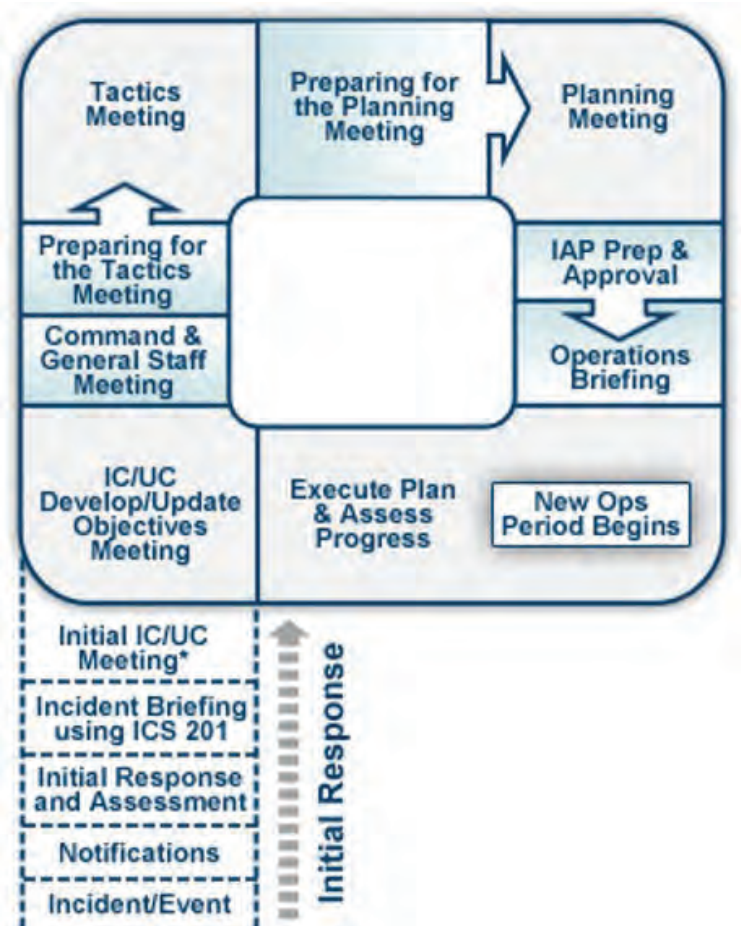
Operations

Human remains recovery work missions have now ended. As of this publication, search teams have retrieved all six of the deceased bridge workers from the water. Announcements of this work in April and early May 2024 were posted in English and Spanish on the Key Bridge Response 2024 website. However, this incident dramatically impacted the immigrant and working-class groups as well as others in and around Baltimore, as recovery efforts ran concurrent with restoring portions of the channel, removing the underwater bridge parts, investigating the crash, recovering the (sometimes hazardous material) cargo containers that fell off the ship, and conducting other recovery phase work. In one unity-of-effort example, a diver working on debris removal had to change the mission after finding a vehicle underneath the wreckage. By May 9, 2024, the unified command authorized the use of explosives to help remove the remainder of the fallen bridge section that prevented the *DALI* from moving.

Planning

Planners must coordinate, collaborate, cooperate, and communicate with everyone involved in the operation for the next steps – tomorrow's incident action plan and mission assignments. As noted earlier, the LIPER dictates priorities. It is the planners' job to guide everyone through a common unified pattern of meetings, discussions, adjustments,

Fig. 2. Planning P, which includes the repeating Operational "O," as each operational period starts another series of actions (*Source*: FEMA).

The *DALI* is safely refloated and transited to local marine terminal, as members of the Unified Command observe, May 20, 2024, during the Key Bridge Response 2024 (*Source:* Christopher Rosario/U.S. Army Corps of Engineers, Baltimore District).

etc., through the spiral of the "Operational O" at the recovery and debris removal point of this operation.

Priorities continually change over time, but unity of effort is necessary to accomplish any mission. For example, now that *DALI* has been refloated, recovery efforts will shift from relocation planning to other mission areas.

Intelligence and Investigation

According to personal communication between the author and the public information officer group of the response, the unified command for the Key Bridge collapse did not initially establish a separate grouping for intelligence and investigation. The unified command directly manages the intelligence, with different incident command systems (Federal Bureau of Investigation, National Transportation Safety Board, U.S. Army Corps of Engineers, etc.) conducting the investigation leadership. Curating intelligence – and sharing it with the rest of the command and general staff, as needed – is required for this type of incident. Siloing intelligence has historically had downfalls in other incidents, including those that involved chemical spills, such as the Paulsboro, New Jersey train derailment in 2012. However, this operation is providing the public with a high degree of transparency of its curated intelligence on what the response is doing, how, and why. This also helps to quell misinformation and disinformation.

An Incident Response Still in Progress

As of publication, all the missing people have been recovered, debris is still being

removed from the river, the *DALI* has yet to be relocated, and different depth channels from the open waterway to and from the Port of Baltimore are still being established. With all these missions, the Incident Command System is constantly being adjusted. From an investigative perspective, the National Transportation Safety Board (NTSB) is one of the groups that initially coordinated its independent investigation work on-scene, collaboratively through a liaison officer at the unified command team. When the NTSB was doing its on-scene work, they benefited from being part of the unified command.

Other continuing marine investigation activities are now being coordinated under the operations group, led by U.S. Coast Guard District 5, which covers Sector Maryland – National Capital Region. The U.S. Coast Guard is the federal on-scene coordinator for the unified command team. It certainly helps to have all the groups conducting investigations *included* in the unity of effort so that evidence is not destroyed, mishandled, etc., and that the overall workforce safety priorities on the Key Bridge collapse also included the safety of all of the various investigators who worked on this site.

The Key Bridge Response 2024's unified command is continuing to provide information to the public via its previously noted website and media releases. According to its Community Information and Outreach page, "Through proactive outreach, inclusive dialogue, and collaborative efforts, the goal is to establish trust, foster understanding, and address the unique needs and concerns of impacted residents and communities."

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This article is the third in a series on the Key Bridge collapse:

Key Bridge Collapse – Transportation Infrastructure and Global Supply Chain

Week 2 – Restoring Infrastructure and Instilling Resilience

Key Bridge Collapse: Unity of Effort

Michael Prasad joins Joseph J. Leonard Jr. in providing additional emergency management perspectives to this incident's response and recovery work. The U.S. Coast Guard (USCG) is leading a transparent operation under a unified command that aligns with the National Incident Management System's (NIMS) constructs and concepts. These articles aim not to be critical of the Herculean effort needed but to provide more insight to other emergency preparedness, response, and recovery professionals and the public about implementing whole-community, full-cycle emergency management for this disaster.

Michael Prasad is a Certified Emergency Manager®, a senior research analyst at Barton Dunant – Emergency Management Training and Consulting (www.bartondunant.com), and the executive director of the Center for Emergency Management Intelligence Research (www.cemir.org). Mr. Prasad has held emergency management director-level positions at the State of New Jersey and the American Red Cross, serving in leadership positions on more than 25 disaster response operations, including Superstorm Sandy's response and recovery work. He researches and writes professionally on emergency management policies and procedures from a pracademic perspective. His first book, "Emergency Management Threats and Hazards: Water," is scheduled for publication by Taylor & Francis/CRC Press in September 2024 – and will now have updates based on this water-related incident. He holds a Bachelor of Business Administration degree from Ohio University and a Master of Arts degree in emergency and disaster management from American Public University. Views expressed do not necessarily represent the official position of any of these organizations.

National Security: A Range of Threats

By Anthony Mottola and Richard Schoeberl

The United States faces myriad threats, from the porous southwest border to common adversaries – Russia, China, Iran, and North Korea. Combining the known actors, the ongoing threat of spillover violence from the Israel-Hamas War, and a surge of confidence among Islamic State Khorasan (ISIS-K) supporters, the United States has cause for concern. The heightened level of imminent threats raises concerns across the intelligence community spectrum:

- On April 12, 2024, Mike Casey, the director of the National Counterintelligence and Security Center, stated, "The scale is impressive and terrifying."

- Federal Bureau of Investigation (FBI) Director Christopher Wray echoed Casey's concern to the House Appropriations Committee in April 2024, "Now, increasingly concerning is the potential for a coordinated attack here in the homeland, akin to the ISIS-K attack we saw at the Russia concert hall a couple weeks ago." Wray also stated before Congress, "the range of threats… is enormous." To add complexity to the "enormous range of threats" was Iran's most recent attack on Israel.

- House Homeland Security Committee Chairman Mark E. Green said in a statement in late March 2024 that "The Islamic Republic of Iran presents a clear and present danger to the United States homeland and our allies," as do the "Iran-backed terror groups and the national security threats posed by the 'Axis of Resistance,' which includes Hizballah, Hamas, the Houthis, Palestinian Islamic Jihad, and various Iraqi and Syrian militia groups."

A Historical Look at Current Threats

For members of Iran's "Axis of Resistance," gambling with escalatory threats is not new. Since the late 1970s, the Iranian government's terror networks began to extend their influence beyond the Middle East into Latin America, aligning with drug cartels and corrupt politicians. Tehran believed the region was ideal for creating anti-American and Western civilization propaganda with its geographic proximity to the United States. Iran's presence continued to gain momentum in Latin America in the 1980s after the first cleric, Ayatollah

Khomeini, was elected and founded the Islamic Republic of Iran. After Khomeini, one of the most controversial Iranian extremists, Mahmoud Ahmadinejad was elected president in 2005 and began strengthening ties with Latin America and the nuclearization of Iran. In 2009, Ahmadinejad created an alliance with Venezuela's President Hugo Chavez that led to other partnerships in the region with Ecuador and Bolivia, which Chavez brokered. Ahmadinejad and Chavez condemned Israel with antisemitic remarks and threats during Ahmadinejad's 2009 tour of Latin America. Iran, Russia, and China have all been linked to drug cartels, narcotics trafficking, and violence in Latin American countries.

The foreign terrorist organization Hezbollah, a known proxy of Iran, has been linked to two terrorist bombings in Argentina (the Israeli Embassy in 1992 and the Jewish community in 1994), resulting in 114 civilian deaths and approximately 500 injured. In December 2023, the U.S. Department of Justice charged Samuel Salman El Reda – a dual citizen of Colombia and Lebanon and a ranking member of Hezbollah's Islamic Jihad Organization – with terrorism. U.S. Attorney Damian Williams for the Southern District of New York stated, "El Reda has led terrorist operations on behalf of the Islamic Jihad Organization of Hezbollah, including a 1994 bombing in Buenos Aires that massacred 85 innocent victims." Although that attack took place in the 1990s, Hezbollah maintains a foothold in the region.

In November 2023, the Brazilian Federal Police, with the assistance of Israel's lead intelligence agency Mossad, foiled a terrorist plot and arrested two subjects with ties to Hezbollah plans to attack Jewish communities in Latin America. In 2024, an Iraqi citizen living in Ohio pleaded guilty to a plot to kill former President George W. Bush and provide material support to a terrorist organization. The subject, former

al Qaeda member Shihab Ahmed Shihab Shihab, was sentenced to 15 years in prison after successfully smuggling an unknown ISIS member through the U.S. southern border. Shihab also previously bragged to FBI informants about smuggling two Hezbollah members into the United States. Shihab did not elaborate on the U.S. entry point used to smuggle the terrorists, but Shihab's previous *modus operandi* was entering the U.S. at the southern border.

Porous Borders

It is naïve to believe these infiltrations will not extend to U.S. soil. In December 2023, before the Committee on Homeland Security, FBI Director Wray expressed grave concern over the national security threat the growing number of "gotaways" poses at the Southwest border, which could exceed 1.5 million. U.S. Customs recorded a record 2.4 million encounters at the Southwest border (3.2 million encounters nationwide) in 2023. Over 564 of those known encounters were on the Terrorist Screening Center watchlist, a list compiled of people reasonably suspected to be involved in terrorism or related activities. What is not known, however, is the number of watchlist members within the growing number of "gotaways." In a March 2023 hearing, prior U.S. Border Patrol Chief Raul Ortiz testified before the Committee on Homeland Security that the total "gotaways" are likely 20% higher than public reporting. The porous border is just one of the "range of threats" the FBI director expressed.

In 2021, Yale University's School of Management estimated 22.1 million as the total number of undocumented migrants in the U.S., which raises national security and policing concerns for federal, state, and local law enforcement agencies across the country. For example, state and local law enforcement agencies may have difficulty identifying

migrants with fraudulent identification during criminal investigations. However, these agencies cannot request federal partner assistance if they have not charged the subject with a crime. In addition, the influx of migrants outside Latin America or the Caribbean has increased expeditiously:

- Chinese migrants attempting to cross the U.S. southern border grew [from 900 in 2022 to 6,000 in 2023](#).
- In 2023, the U.S. House Homeland Security Subcommittee identified Customs and Border Protection encounters of Russian migrants at the southern border rose [704%](#) from 2021 to 2023. The Ukraine-Russia war could have an effect and be responsible for migrants increasingly fleeing their war-torn country.

The intelligence community must consider the porous border vulnerabilities that communist countries or foreign terrorist organizations like ISIS-K and Hezbollah could exploit as an incentive to carry out terrorist attacks or espionage.

The Activities and Influence of Terrorist Networks

Relatively new to the international scene, ISIS-K nonetheless marks a return to the globally minded, well-organized jihadist tactics the Taliban enabled in the 1990s. Formed in 2015, ISIS-K is the Islamic State group's Afghanistan affiliate and one of the most active regional affiliates of the militant group – another "range of threats" to national security. The withdrawal of U.S. troops in 2021 has reduced the ability to develop intelligence against groups in Afghanistan like ISIS-K, making it difficult for the intelligence community to assess the capabilities of terror groups. However, ISIS-K demonstrated capabilities during the deadly shooting on March 22, 2024, at the Crocus City

Hall Moscow, killing at least 139 people and wounding 182. The U.S. has since confirmed the Islamic State's claim of responsibility. Moscow was ISIS-K's first successful mass casualty attack outside of its traditional area of operations. In the aftermath of the Russia attack, the former head of U.S. Central Command, Frank McKenzie, [said](#), "[ISIS] has a strong desire to attack our homeland. … We should believe them when they say that. They're going to try to do it."

From a national security standpoint, another "range of threats" is not so much the potential physical reach of Hamas and Hezbollah but more their actions inspiring potential terrorist attacks globally, including violent extremists in the U.S. Since October 2023, Hamas has been the intelligence community's key focus, with many agencies forecasting a terrorist attack to retaliate for U.S. military support for Israel. Attacks could range from homegrown violent extremists inspired by ISIS, Hezbollah, or Hamas' actions and retaliate against the U.S. for support of Israel, as well as domestic violent extremists who might target Muslim or Jewish communities. [Evidence](#) of this includes the arrest of a 20-year-old Middle Eastern male on an expired nonimmigrant visa for "plotting to attack a Jewish gathering." The FBI has [stated](#) that extremists, including homegrown violent extremists and foreign terrorist organizations, are targeting Jewish communities.

Although Hamas does not technically have a worldwide terrorist network, it has [called for action abroad](#) to support its cause. The global jihadist movement is both opportunistic and resilient. As the threat ebbs and flows domestically and the homegrown jihadist threat diminishes, the Israel-Hamas war offers jihadist groups another opportunity for resurgence. The Hamas attacks have inspired the Islamic State, Hezbollah, and al Qaeda, who have directed their supporters to attack Israeli

and U.S. interests. The Islamic State remains an international terrorist network even as it relies more on regional branches due to senior leadership losses in recent years. Iran's Islamic Republic could finance these networks through illicit funds based on U.S. sanctions and the support of Israel.

Nation-State Support

In February 2024, two foreign citizens were federally charged in the U.S. for utilizing U.S. financial institutions for a money laundering scheme to finance the Islamic Revolutionary Guard Corps and other militant groups. Homeland Security Investigations Special Agent in Charge Derek W. Gordon stated subjects, "Shaoyun Wang and Mahmood Rashid Amur Al Habsi defrauded the U.S. financial system to facilitate hundreds of millions of dollars in oil sales in order to support terrorists." Further compounding the "range of threats" facing the U.S. are China's illicit purchases of Iranian oil, which indirectly financed recent proxy terror attacks. Over the years, China and Iran developed an oil trade system that bypassed Western financial and shipping services. China purchases upward of 90% of Iranian oil, including oil sold by the Quds Force, the paramilitary arm of the Islamic Revolutionary Guard Corps, which is responsible for Tehran's foreign military operations.

The link between Iran and China in petroleum trafficking can have greater implications as war looms between Israel and Iran. Iran increased oil production in 2023, fueling concerns that China, the largest importer of petroleum, is supporting terrorist organizations like Hamas, Hezbollah, and Iran's Islamic Revolutionary Guard Corps by proxy. China and Iran engaging in covert crude oil transactions indicates that China is attempting to circumvent U.S. sanctions on Iran and countries engaging in petroleum schemes. The current escalation of the Israel and Iran conflict indicates why China

chooses to support Iran. This partnership is further empowering Iran as they stockpile uranium for nuclear capabilities that political alliances with China and Russia support. These alliances have a direct connection to the U.S. southern border and possibly future terrorist attacks in the U.S.

As federal, state, and local law enforcement focus on the growing antisemitism and Israeli-Palestinian protests across the U.S., foreign adversaries see opportunities. The U.S. intelligence community must increase efforts in human intelligence, open-source intelligence, and electronic surveillance to prevent homegrown extremists and foreign terrorist organizations from carrying out attacks. Air Force Lt. Gen. Jeffrey Kruse, director of the Defense Intelligence Agency, stated, "The trajectory and rate of change in the national security arena is perhaps the highest and most consequential we've seen in our lifetime."

Threat of Attack on U.S. Soil

The U.S. national security capabilities are stretched thin and struggle to manage the international strife that continues to fuel the sequence of violence, insurgencies, and regional conflicts. Often driven by social division, competing ideologies, and the inability of the regions to deliver on elementary human needs further stimulates structural violence. Such violence occurs when economic and political structures systematically deprive need satisfaction for certain segments of society. With the ongoing narratives motivating such violence further – often inspired by revenge, retribution, and religious and ethnic hatred – solutions must be explored to meet these ongoing challenges and "range of threats." These solutions may include:

- *More People* – Large and small law enforcement agencies across the country are experiencing a law

enforcement officer shortage. These U.S. agencies continue to struggle with hiring new officers at the same rate as staffing losses each year, according to a 2023 study from the Police Executive Research Forum. The shortage makes it difficult to maintain the status quo and address new and emerging threats.

- *Community Policing 2.0* – Community policing efforts should be enhanced to include creating open lines of communication with migrant communities and improving relationships between immigrants and law enforcement agencies. For example, one agency attempting to gather intelligence from these relationships is the New York City Police Department (NYPD). The NYPD's Community Policing, Community Affairs, and Counter Terrorism Unit reach out to these communities with officers who speak the same language or have the same ethnicity or culture, but this has its limits. Support from federal agencies like DHS to remove violent offenders from the city streets is still necessary to prevent transnational organized crime and criminal gangs from victimizing the immigrant communities that law enforcement agencies attempt to protect. Porous and uncontrolled borders continue to allow transnational criminal syndicates and violent extremist groups to capitalize on the trafficking and smuggling of humans, narcotics, and weapons. DHS's Customs and Border Patrol must be able to conduct its operations according to the law without political interference and accomplish its primary responsibility of preventing people from entering the U.S. illegally.
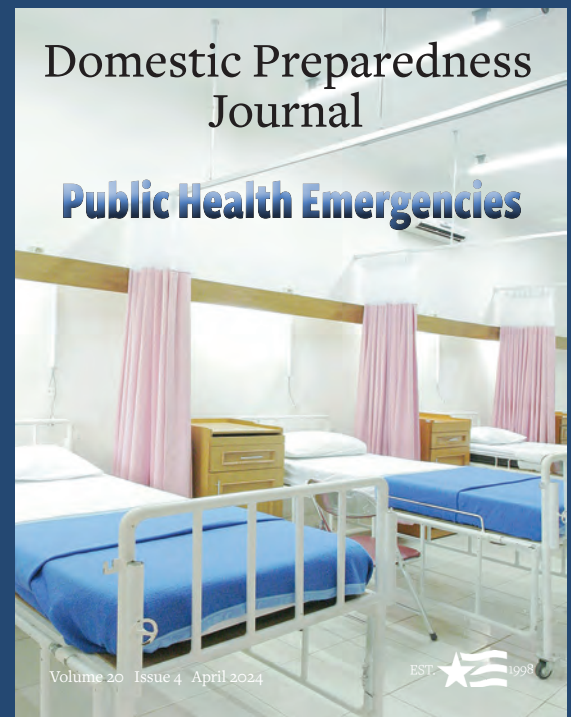
- *Increased Intelligence Community Funding* – Funding cuts in the U.S. government's 2024 fiscal spending package for intelligence community members would hamper counterintelligence activities and, according to FBI Director Wray, does not allow the FBI to sustain current operations needed to protect the American people. The U.S. intelligence community and law enforcement agencies face a greater "range of threats" than in previous years: the threat from foreign terrorists following the October 7 attack in Israel; border insecurity and transnational organized crime forcing fentanyl and other dangerous drugs into the country; the flood of cyberattacks impacting critical infrastructure and businesses from known actors like China, Russia, and Iran; the rise in post-pandemic violent crime reaching alarming levels; and China's persistent efforts to steal intellectual property and valuable information, to name a few.

- *Enhanced Law Enforcement Agency Interaction* – Federal, state, and local law enforcement agencies often lack collaboration regarding undocumented migrants, in part, due to "Sanctuary City" policies, particularly in larger metropolitan areas. Local agencies in the U.S. typically have the most contact with civilians, including documented and undocumented migrants. For these agencies to be successful in controlling crime, ensuring public safety, providing victim advocacy, and preventing future terrorist attacks, the limitations on federal, state, and local agencies to work together must be reevaluated so agencies can work fluidly across all sectors. For example, correctional agencies should notify their U.S. Department of Homeland Security (DHS) counterparts of undocumented migrants charged or convicted of violent offenses. This notification will prevent local agencies from appearing as extensions of immigration enforcement and help maintain communications between the community and local police.

- *Seamless Intelligence Sharing* – National security depends on the ability to share the right information, with the right people, and at the right time. However, information sharing requires sustained and responsible collaboration between federal, state, local, private sector, and foreign partners, removed from political aspirations. Promoting seamless intelligence sharing across the intelligence community and law enforcement agency platforms facilitates a successful streamlined process. This process integrates information systems to enable information sharing at the federal, state, and local levels. Such integration would improve information sharing and safeguard processes and capabilities while strengthening intelligence integration and making it seamless among those in place to protect U.S. citizens.

Members of the intelligence community have indicated that the threat of attack inside the U.S. has increased to its highest point since the terrorist attacks of September 11, 2001. The director of national intelligence issued the 2024 Annual Threat Assessment report, which solidifies that the U.S. "faces an increasingly fragile global order strained by" great power competition, transnational challenges, and regional conflicts. The report emphasizes a critical fear that the ongoing conflict in the Middle East, specifically in Gaza between Israel and Hamas, threatens to spread worldwide uncertainty and violence. The conflict – now lasting six months – has reinvigorated the

instability in the region, pulling in known actors to increase the concern that the "regional" conflict will now have broader and less predictable global implications.

Additionally, the "range of threats" comes from terrorist groups like al-Qaeda and ISIS, who leverage the Middle East crisis to generate propaganda to inspire followers to conduct attacks. "Homegrown" terrorists – individuals or small net groups that will be or have been inspired by the ongoing conflict in the Middle East to carry out attacks in the U.S. – are of immediate concern. Although an attempted large-scale attack is the inspirational plan for these groups, a small-scale or "lone wolf"

style attack is more likely. Regardless, the imminent threats looming are of significant national security concern. The director of national intelligence, Avril Haines, stated, "The crisis has galvanized violence by a range of actors around the world." For the U.S., the growing "range of threats" stems from known and unknown actors domestically and abroad. These threats worsen with less border security, increased conflict spreading from the Middle East, and the developing relationships among the Chinese, Russian, Iranian, and North Korean governments as they demonstrate on the world stage their eagerness to cooperate in economic, political, military, and intelligence matters.

Anthony (Tony) Mottola, Ph.D. has over 35 years of law enforcement and security experience including the New York City Police Department, United States Air Force, and the National Basketball Association (NBA). He retired as a sergeant detective (SDS) after 25 years as a member of the New York Police Department (NYPD). He served as executive officer for the NYPD Intelligence Bureau's Strategic Unit, which is a covert counterterrorism initiative and director of the Domestic Liaison Program. He represented the Intelligence Bureau in numerous investigations including the Boston Bombing, civil unrest, mass shootings, and large-scale incidents outside New York City. During his tenure with the NYPD, he worked additional assignments in Counter Terrorism, Gang Intelligence, Detective Bureau, Task Force, Street Narcotics Enforcement Unit, anti-gang/graffiti units, and patrol. He was a first responder/search leader for recovery efforts and supervisor of security details in the immediate aftermath of the World Trade Center attacks. Dr. Mottola has conducted extensive research into human trafficking, labor trafficking, border operations, and transnational organized crime. He is currently an Assistant Professor of Criminology and Homeland Security at the University of Tennessee-Southern.

Richard Schoeberl, Ph.D., has over 30 years of law enforcement experience, including the Federal Bureau of Investigation (FBI) and the National Counterterrorism Center (NCTC). He has served in a variety of positions throughout his career, ranging from a supervisory special agent at the FBI's headquarters in Washington, DC, to unit chief of the International Terrorism Operations Section at the NCTC's headquarters in Langley, Virginia. Before these organizations, he worked as a special agent investigating violent crime, human trafficking, international terrorism, and organized crime. He was also assigned numerous collateral duties during his FBI tour – including as a certified instructor and member of the agency's SWAT program. In addition to the FBI and NCTC, he is an author and has served as a media contributor for Fox News, CNN, PBS, NPR, Al-Jazeera Television, Al Arabiva Television, Al Hurra, and Sky News in Europe. Additionally, he has authored numerous scholarly articles, serves as a peer mentor with the Police Executive Research Forum, is currently a professor of Criminology and Homeland Security at the University of Tennessee-Southern, and works with Hope for Justice – a global nonprofit combatting human trafficking.

Resilience-Based CI and Domestic Preparedness: A Long-Overdue Imperative

By Jeff Gaynor

In one of the latest in a long and unacceptable list of otherwise avoidable critical infrastructure (CI)-enabled consequences, on March 26, 2024, the combination of a vulnerable bridge structure coupled with a loss of power on an outbound ship produced a catastrophic infrastructure failure when that ship collided with the Key Bridge in the port of Baltimore, Maryland. That local incident produced cascading consequences on land and sea transportation routes and trade into and out of the area.

Advancements in CI preparedness thought, policy, planning, and execution are long overdue. Through continuous CI innovation and implementation of operationally proven, objectively measurable, nationally comprehensive,

and compatible preparedness mindsets, metrics, methodologies, and technologies, the U.S. can realize and sustain CI resilience and optimally ensure the comprehensive preparedness of CI and the spectrum of American life it enables.

To the above ends, it is worthy of note it has been 18 years since – in the wake of the long-predicted catastrophic failure of the "protected" New Orleans levee system – the Homeland Security Advisory Council's (HSAC) 2006 Critical Infrastructure Task Force Report, made as its principal recommendation: "Promulgate Critical Infrastructure Resilience as the top-level-strategic objective – the desired outcome to drive national policy and planning." It has been 13 years since the HSAC's Community Resilience Task Force recommended a

community-by-community "American Resilience Assessment" and 11 years since Presidential Policy Directive 21 made "Critical Infrastructure Security and Resilience" the nation's CI preparedness goals. As evidenced by near-daily accounts of the failures of and successful attacks upon U.S. infrastructures, resilience-based CI preparedness and, by extension, community and domestic preparedness are increasingly conspicuous in their absence.

Self-Inflicted Vulnerabilities and Objectively Unmeasurable Goals

Owing to the "flexibility" of American English and consistent with President Ronald Reagan's observation in 1985 that "Status quo you know is Latin for the mess we are in," Americans have popularized and effectively homogenized the term "resilience" into iterations of 1990s-era CI protection, information systems security, and preparedness goals. As a result, currently inextricably cyber-reliant CI and domestic preparedness trajectories in the U.S. continue to make the nation more exploitable, exploited, and consequence-enabling. In reality, cyber-reliant CI invites and multiplies consequences. Compounding this situation, as U.S. energy needs increase and billions are earmarked for CI projects, the country has restricted domestic energy production, sold its oil reserves, and become increasingly reliant on China, a nation decisively engaged in transforming U.S. CI into vectors to inflict consequences of unprecedented scope, duration, and intensity on the nation.

The U.S. has been unable to transcend "the mess we are in" largely because, for the past 28 years, it has focused on achieving objectively unmeasurable CI and domestic preparedness goals. No one can quantify how much protection or security is required to achieve and sustain the conditions the words imply. To sharpen the focus on this "mess," author Alex Haley provides insight: "Either you deal with what is the reality, or you can be sure that the reality is going to deal with you." The CI and domestic preparedness reality is that – absent timely CI product and service delivery – the country will quickly spiral into ~330 million people fighting each other to survive. Despite that reality, the nation's reliance on cyberspace continues to grow. Reliance attracts global and domestic predators and focuses their CI targeting. Federal agencies have confirmed China's "state-sponsored cyber actors are seeking to pre-position themselves on IT networks for disruptive or destructive cyberattacks against U.S. critical infrastructure in the event of a major crisis or conflict with the United States."

Examining the Nation's CI and Domestic Preparedness Organization and Lexicon

Like its predecessor organizations, the Cybersecurity & Infrastructure Security Agency organizes federal CI policies and programs into 16 functional (i.e., "vertical" top-down) sectors. The reality is CI operations naturally integrate and operate horizontally – community-by-community – across the country. Thus, both vertical and horizontal CI perspectives and requirements must be equally sought, respected and acted upon.

In the wake of the events of September 11, 2001, response and recovery has been the primary focus of CI and domestic preparedness efforts. In doing the right thing 23 years ago, the nation effectively lost and must regain emphasis on the proactive (i.e., preparedness) side of the event curve specifically, prevention and continuity. In this regard and in 2018 dollars, it is estimated that for every dollar spent on mitigation efforts, $6 dollars in response and recovery operations are saved. This figure does not

Source: DHS/CISA

include prolonged human suffering and costs stemming from opportunistic crime, panic, and societal collapse.

While essential to awareness, understanding, meaningful change, and preparedness, language has played a subtle yet pivotal role in maintaining an inadequate CI and national preparedness status quo. An undisciplined lexicon must be recognized and rejected. Given CI and domestic preparedness realities, there can no longer be tolerance for ambiguity or blurring the distinctions between words, including *activity* and *accomplishment*, **iteration** and *innovation*, *process* and *progress*, *rhetoric* and *results*. In the current absence of disciplined, question-and-answer-based "information exchange" and objectively measurable progress in correcting CI and preparedness trajectories, the popular lexicon has proven itself a barrier to achieving long-overdue change.

Correcting U.S. CI and Domestic Preparedness Trajectories

First, continuous innovation (not iteration) in CI and domestic preparedness is imperative. Amplifying his definition of insanity, Albert Einstein noted: "We cannot solve our problems with the same thinking we used when we created them."

Second, an advanced, reality-based culture of CI and domestic preparedness driven by resilience-based mindsets must be implemented. These mindsets include:

- Behind every silver lining is a dark cloud.
- Never assume or be satisfied with the status quo.
- Reality is the ultimate measure of success or failure.
- Everything is a target, and the internet is a global vector to U.S. targets.
- Anticipate, accept, and prepare for CI and domestic preparedness failures.

Operationalize Resilience
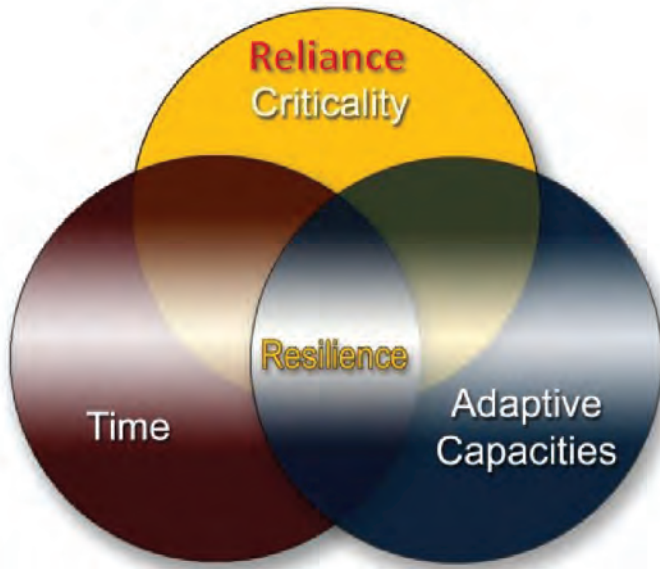
Fig. 1. Operationalized Resilience (*Credit*: American Resilience, LLC 2011-2024).

- Accept no single point of failure (e.g., the New Orleans levee system, high-consequence-producing automated systems).

- Add reliance to risk elements (i.e., threat, vulnerability, and consequence), exercises, and resilience assessments.

- Respect "the predator's view" (i.e., the "view" from the outside looking in) and understand the dangers of public pronouncements, and advertising that focus predator targeting. In addition, heed the teachings of Sun Tzu: "The opportunity of defeating an enemy is provided by the enemy himself" and "Never interrupt your enemy when he is making a mistake."

- Equalize resilience-based CI protection, cybersecurity, and domestic preparedness efforts across the event continuum (i.e.,

prevention and continuity, response and recovery).

- "Lessons learned" not acted upon are consequence enablers and amplifiers.

- The only acceptable "new normal" is one superior to its predecessor.

Third, objectively measurable, operationally proven, nationally comprehensive, and compatible preparedness goals can and must be achieved. In so doing, the country can and will provide for the predictable provision of CI products and services and the continuity of American life.

Unlike CI protection, cybersecurity, and information-sharing efforts, resilience is objectively measurable. Time is a universally accepted metric and is the metric of resilience. Time makes CI and domestic preparedness quantifiable and thus manageable, achievable, and sustainable.

As Einstein observed: "If you can't explain it simply, you don't know it well enough." Accordingly, Figure 1 illustrates the practice of resilience. It is the convergence of continuously knowing:

- What an entity (i.e., individual, family, business, community, nation) finds important or critical and what it is reliant upon.

- How long that entity is willing to be without something important or critical or something it is reliant upon; and

- The identification, testing, and availability of adaptive capacities and alternative CI products and services to ensure (at worst) predictable recovery from events short of a global Armageddon.

Additionally, the U.S. must begin reducing its cyber-reliant target values. Technologies must be made SMARTR (SMART + Resilient, pronounced smarter), and "back to the future" solutions must be implemented including:

- Mandating physical overrides, training people, and annually certifying them to operate overrides on all high-consequence-producing networked or automated CI systems; and

- Retaining hard copies of all vital (i.e., consequence-producing) information to reduce or eliminate the consequences of ransomware.

In a nutshell, resilience-based CI and, by extension, domestic preparedness are cost-neutral, proactive, operationally proven, objectively measurable, comprehensive, compatible, achievable, sustainable, unifying, and empowering end states. Uniquely, resilience-based CI and domestic preparedness allow people, businesses, and communities nationwide to work first in their best interests and, ultimately, in the best interests of all.

The Bottom Line

The U.S. cannot afford to maintain iterations of its 1990s-era CI and domestic preparedness goals and thereby continue to learn the hard way. Military historian and Hoover Institution Senior Fellow Dr. Victor Davis Hanson's quote perhaps best captures the decidedly human preparedness obstacle the country must quickly overcome: "States are like people. They do not question the awful status quo until some dramatic event overturns the conventional and lax way of thinking." After 18 years, a much higher CI and domestic preparedness bar must finally be set. The U.S. must operationalize resilience-based preparedness across the spectrum of its daily life. Only in so doing can the country simultaneously prevent the otherwise guaranteed infliction of CI-enabled consequences and ensure the safety, security, preparedness, quality of life, and future for this and generations of Americans to follow.

Retired U.S. Army Colonel Jeff Gaynor brings six decades of highly decorated military, communications monitoring and combat arms, intelligence, counterintelligence, defense intelligence senior executive service, and private sector critical infrastructure (CI) and national security and preparedness expertise to the most fundamental and urgent of national imperatives: Ensuring the operational resilience of the nation's CI. His experience ranges from foxholes to the White House as President Ronald Reagan's and George H.W. Bush's communications security officer, as the principal action officer for the creation of the Defense Department's Information Assurance Program, and as the Defense Department's Y2K operations officer. Nine months before the long-predicted failure of the "protected" New Orleans Levee System, Jeff created and directed the Homeland Security Advisory Council's Critical Infrastructure Task Force (CITF). The CITF questioned the effectiveness of the CI protection status quo and, in its January 2006 report, recommended critical infrastructure resilience be promulgated as "the top-level strategic objective – the desired outcome to drive national policy and planning." Almost two decades later, Jeff continues to spearhead the physical implementation of resilience-based CI, business, community, and national preparedness mindsets, metrics, methodologies, and technologies for the U.S. and its allies.