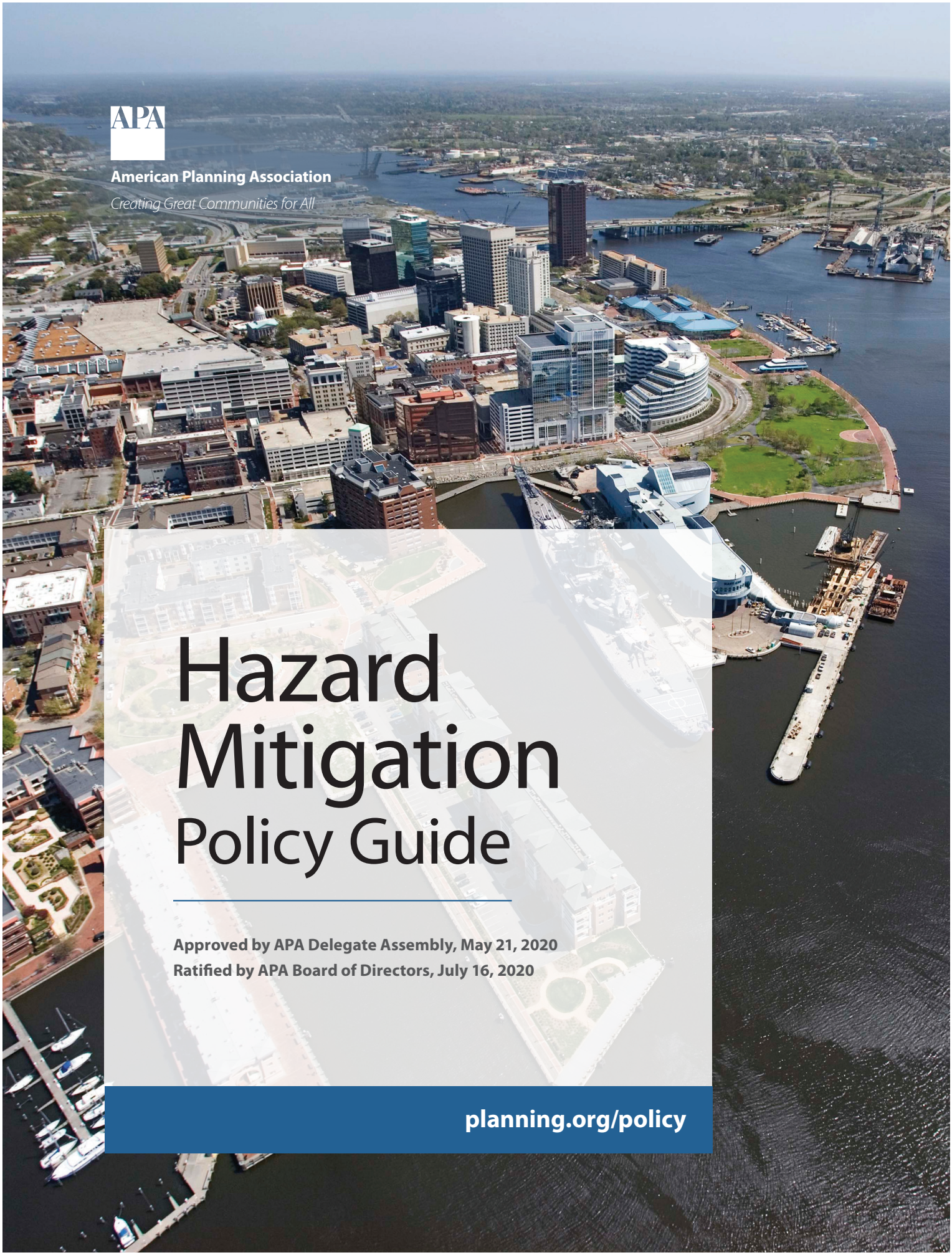

American Planning Association

Creating Great Communities for All

Hazard Mitigation Policy Guide

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The American Planning Association advocates for public policies that create just, healthy, and prosperous communities that expand opportunity for all through good planning. APA's advocacy is based on adopted positions and principles contained in policy guides. These guides address the critical policy issues confronting planners and communities by identifying solutions for local, state, and federal policy makers. Policy guides are led by the APA Legislative and Policy Committee, ratified by the APA Board of Directors, and developed through the careful and extensive involvement of planners across the country. APA policy guides articulate and advance the principles of good planning in law and regulation.

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TABLE OF CONTENTS

3 Introduction
4 Guiding Policies
6 Hazard Mitigation Versus Adaptation Versus Response/Recovery
8 Benefits of Hazard Mitigation Planning
9 Hazard Mitigation Planning Process
10 Adaptation and Recovery
11 Policy Outcomes
27 References and Further Reading

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Cover image: *Norfolk, Virginia, is preparing for future floods by requiring the lowest habitable floor of new construction in the 500-year floodplain to be 18 inches above highest adjacent grade. (© JupiterImages/gettyimages.com)*

INTRODUCTION

The American Planning Association (APA) and its Chapters and Divisions support measures and policies to enhance awareness of risks and efforts to improve community preparedness, health, resilience, and sustainability in the face of both natural and human-caused hazards. The differences and the tension between adaptation, response, and recovery—including decisions about whether and how to rebuild following a disaster—are discussed throughout this Policy Guide. The American Planning Association and its Chapters and Divisions are ideally suited to assist with the community, state, and national dialogue on these issues because as planners, ours is a profession that cuts across all other hazard mitigation-centered disciplines while focusing on shared futures.

Hazard mitigation is a key element of building resilient communities. Today, we are better able to identify hazards, both natural and human-caused, and forecast risk than any other time in human history, and we have every expectation that these abilities will improve with research, technology, and time. And yet, regardless of the sophistication of our models and the sweep of our knowledge, there is an element of chance in every hazard we face. For example, we may know what is likely to happen during an earthquake, but cannot with certainty predict when it will come, how strong it will be, or where the epicenter may be. Conversely, we may know to expect the possibility of cyberattacks or terrorism at certain times, but not be able to predict what form those attacks will take or where. Thus, community resilience requires planning and preparing for multiple hazards—often through a natural hazards mitigation plan or other plan, sometimes referred to as an All-Hazards Plan—and this requires planners to assume a leading role in coordinating across agencies and disciplines, supporting proactive thinking and collaboration to break down silos that impede communication and cooperation.

Identifying and planning for hazards before they strike can help mitigate the impacts to people, property, and the environment. In creating an effective and efficient environment to aid in both preparedness for hazards and coordination before, during, and after disasters, it is critical to include government and regulatory agencies, nongovernmental entities, community-based organizations (including faith-based), educational institutions, private-sector organizations (including health-care providers), the business community, and residents in hazard mitigation planning.

Policy declarations regarding hazard mitigation are closely linked to the policy declarations in the American Planning Association's Climate Change, Equity, Healthy Communities, Smart Growth, Security, Water Policy Guides and Sustainability Policy Framework. These are intentionally not repeated in this declaration and are referenced at the end.

GUIDING POLICIES

The Guiding Policies provide an overarching "big picture" reference point for the American Planning Association and its Chapters and Divisions on the topic of hazard mitigation. They are intended as frames within which the specific policy declarations that follow are placed, thus providing a larger context for the individual policy declarations while simultaneously articulating the core beliefs of the organization on this topic.

A. Best Practices

The American Planning Association and its Chapters and Divisions encourage planners and decision makers to develop, share, and use best practices and to insist that such practices are based on accepted scientific, engineering, and technological concepts, principles, and processes with a full understanding that the status quo is neither desirable nor acceptable.

B. Data and Predictive Models

The American Planning Association and its Chapters and Divisions recognize the importance of easy, consistent, and affordable access to communitywide and regional data as an integral component of planning for the future. Further, APA and its Chapters and Divisions recognize that investment in developing predictive models that incorporate anticipated hazards from changing climatic and built conditions can begin to reduce risks to people and the places where they live.

C. Resiliency Standards and Damage Resistance

The American Planning Association and its Chapters and Divisions encourage the development and use of resiliency standards throughout the planning, design, and development processes. Such standards would apply to materials, construction techniques, siting of critical facilities and infrastructure, and both new development and redevelopment to mitigate the adverse impacts of natural and human-caused hazards on land use, the environment, the economy, quality of life, public health—physical and mental—and safety, and national security. Moreover, APA and its Chapters and Divisions support continuing research and development of standards and practices that will improve national, community, and individual resilience to sudden shocks as well as slow-moving hazards, both natural and human caused.

D. Equity

The American Planning Association and its Chapters and Divisions are committed to ensuring that all hazards-related policies and programs strive to achieve equitable outcomes and environmental justice for all residents and stakeholders taking into consideration those who, due to location, economic, or environmental conditions, are particularly vulnerable to impacts. An equity-based approach must permeate all hazard mitigation efforts to ensure that individuals who are vulnerable and disadvantaged receive greater attention and actual equity such that they are both less vulnerable and less disadvantaged post-recovery. Resilience planning and implementation should focus on achieving equitable future conditions for all residents. It is especially critical to ensure that communications, education, and outreach efforts reach historically underserved and marginalized communities, as well as those on the wrong end of the digital divide.

E. Incentives

The American Planning Association and its Chapters and Divisions support the development and expansion of programs such as the National Flood Insurance Program (NFIP) Community Rating System (CRS), which provide economic incentives to improve community and individual property resilience to natural and human-caused hazards. Incentives should seek to reduce a cycle of repetitive loss and repair, while prioritizing projects that meet higher construction standards and anticipate new risks. For example, the CRS program helps communities evaluate their floodplain management practices through its activities and provides a scoring system that can reduce flood insurance premiums for NFIP policyholders in a participating community. However, APA and its Chapters and Divisions support a thorough review of the CRS point system to ensure that points reflect truly effective mitigation practices and are available in an equitable manner that does not ultimately benefit communities with relatively greater resources over those with fewer resources. And, in any case, APA and its Chapters and Divisions strongly oppose programs that incentivize dangerous and irresponsible development patterns and behavior such as offering government-subsidized flood insurance to repetitive-loss properties.

F. Public Education and Involvement

The American Planning Association and its Chapters and Divisions will take a lead role in educating their communities on the interrelated issues of hazard risk reduction, mitigation, climate change, adaptation, resiliency, and sustainability. Public schools and curricula are an important component of this educational effort. Further, APA and its Chapters and Divisions recognize the importance of involving the public at all levels of planning and decision making about structural and nonstructural all-hazards mitigation.

G. Preparedness

The American Planning Association and its Chapters and Divisions support legislation, including the Disaster Mitigation Act of 2000 and the Disaster Recovery Reform Act of 2018, and regulations that require federal, state, local, and tribal agencies and entities to develop and implement resiliency and risk reduction measures based on generally accepted understanding of the specific natural and human-caused hazards faced by the agency or entity.

H. Adaptation

The American Planning Association and its Chapters and Divisions support continued investment in infrastructure improvements and land-use modifications that will assist communities and individuals in adapting responsibly to changing conditions. In making this declaration, APA and its Chapters and Divisions recognize that effective and responsible adaptation over time will necessitate changes in land use, building techniques, code requirements, locational decisions, and the design and implementation of risk-reduction measures. All adaptation, mitigation, and resilience strategies should include natural and nature-based solutions.

I. Response and Recovery

The American Planning Association and its Chapters and Divisions encourage federal, state, local, and tribal governments to plan for recovery that enhances future resilience so that the default strategy is not to simply replace what existed with the same thing. APA and its Chapters and Divisions support fiscal planning that sets aside funding for future recovery as a regular budgetary expense to build fund balances instead of having each disaster require a separate funding vehicle. APA also supports flexible and direct federal support to maintain the fiscal stability of state and local governments and related municipal finance markets as an essential element of frontline response and recovery. APA also supports planning for disaster response and most importantly, APA and its Chapters and Divisions strongly urge the adoption of recovery strategies with an equity lens, ensuring that vulnerable and disadvantaged people and groups in the community receive greater attention and actual equity in terms of both pre-disaster vulnerability and post-disaster recovery.

J. State and Local Land-Use Authority

The American Planning Association and its Chapters and Divisions support the integration of locally prepared hazard mitigation policies and principles into local plans, processes, and regulations. This process should reasonably preserve state and local land-use authority with input from regional stakeholders. Federal and state policies should support such integration through incentives, state planning mandates, and other tools suited to local and state needs.

K. Protection of Vulnerable Populations and Assets

The American Planning Association and its Chapters and Divisions recognize that the federal, state, local, and tribal governments have a primary responsibility to identify vulnerable populations and assets, devise strategies with stakeholder input to mitigate the impacts of hazards on them, and ensure full and rigorous implementation in a manner that promotes equity and best protects vulnerable populations and assets. Social equity should be recognized as an essential component of overall community resilience because failure to strengthen the most vulnerable link is a proven path to failure of the entire system.

L. Natural and Nature-Based Solutions

The American Planning Association and its Chapters and Divisions recognize that solutions which mimic natural conditions are less environmentally damaging and more sustainable. Sometimes referred to as "green infrastructure," natural and nature-based solutions contain a wide variety of actions to protect, sustainably manage, and restore natural or modified ecosystems in ways that simultaneously address societal challenges and provide human well-being and biodiversity benefits. Research increasingly is showing that these solutions can provide greater resilience to hazards over time. For example, "daylighting" urban creeks and streams that have previously been piped dramatically reduces stormwater runoff-caused flooding and, if done well, adds to the value of place. Likewise, nature-based management of fire-dependent landscapes, as opposed to a fire-exclusion approach, can both increase ecological value and help reduce wildfire threat.

M. Public Health

The American Planning Association and its Chapters and Divisions recognize that natural and man-made hazards can profoundly affect all aspects of our communities' mental, physical, emotional, and spiritual well-being. The health and well-being of communities at risk are especially vulnerable prior to, during, and after a disaster event. In light of these risks to public health, exemplified by the 2020 COVID-19 pandemic and the prevalence of chronic disease affecting the most vulnerable communities, public health considerations must be explicitly addressed in hazard mitigation planning process. As part of this focus, APA should strengthen its existing relationship with the American Public Health Association and other affiliate organizations and allied professions—including the "Joint Call to Action" signatories.

HAZARD MITIGATION VERSUS ADAPTATION VERSUS RESPONSE/RECOVERY

Community resilience is a three-legged stool comprised of Mitigation, Adaptation, and Response/Recovery. **Hazard Mitigation** comprises a series of actions that lessen the severity or intensity of the hazard's impact when it strikes and begins with avoidance and minimization. **Adaptation** entails modifying the natural or built environment to make it more suited to changed or changing conditions and situations. Adaptation can also mean changes in community behavior that better safeguard human and environmental health when faced with the stresses imposed by hazards of all types. **Response/Recovery** is the response during and after an event to protect public safety, health, and well-being and, ultimately, to facilitate community recovery through repair or replacement, ideally to a more resilient condition. All of these are necessary components of resilience. Planning that focuses on one to the exclusion of the others will not support true resiliency. However, a strong mitigation program can lessen the need for and expense of response and recovery.

Most hazards planning has, heretofore, focused on mitigation and emergency response. By ignoring adaptation strategies and failing to plan for response and recovery, such a narrowly focused planning approach leaves communities vulnerable to even greater risk and costs from future events, and thus less resilient. Communities along the Mississippi and Missouri rivers and the Gulf Coast have learned this lesson repeatedly in recent decades as they rebuilt following flooding and hurricane events only to be forced to rebuild again following subsequent storms and flooding. However, cities like Baltimore and states like Massachusetts have opted to merge climate adaptation plans with hazard mitigation plans because doing so presents the opportunity to examine and plan for both current and projected future hazards as part of the same planning exercise. Such integrative and holistic approaches need to be encouraged.

Hurricanes Katrina in 2005, Sandy in 2012, and Harvey in 2017 crystallize this lesson. In the face of these record-setting storms, evacuation, emergency response, mitigation, and recovery plans were either not in place or were inadequate. Likewise, California communities devastated by wildfires in 2017 and 2018 were overwhelmed by the scope and magnitude of these events. Decades of land-use and infrastructure construction decisions based on the lessons of prior years' events could not cope with the "new normal" brought by climate crisis—drier conditions over a much longer period of time, much higher winds, and significantly more intense storms—and exacerbated by years of deferred maintenance of critical infrastructure. These catastrophes have led communities and state governments to go beyond hazard mitigation and begin thinking about adaptation in the face of ongoing threats. While it is good that the thought process has begun, a mindset of rebuilding exactly what was destroyed continues to dominate local decision making and U.S. Federal Emergency Management Agency (FEMA) funding formulas.

Certain hazard events tend to have similar and predictable impacts from each occurrence. For example, coastal and riverine flooding usually recurs in much the same location, and those areas are fairly predictable. Another example is widespread power outages that have occurred most frequently in the Northeast and across the upper Midwest for reasons easily understood by analyzing the power supply grid. The specific location and impacts from other hazard events are far less predictable, though in some cases—like tornados, tropical storms, and tsunamis—the ability to provide at least some warning is improving. Geography, historical records, and technological advances (especially in computer modeling and weather forecasting) allow us to recognize that certain locations and times of the year are more prone to hazards than other times or locations. Thus, advance planning has become increasingly available as the preferred option.

Appropriate all-hazards planning and preparedness demands that we ask and answer four additional questions:

- How do we adapt to recurring events and changing circumstances (e.g., climate)?
- How do we prepare better to recover stronger and more resilient from events so that the next and subsequent events are less disruptive and damaging?
- How do we ensure that our recovery and resilience efforts equitably benefit all residents, especially socially and economically challenged communities?
- How do we better collaborate and integrate hazards planning in all disciplines?

The status quo is no longer acceptable. Planners have a significant and direct role in planning for community resilience. Appropriate change in land uses, densities, development techniques, building codes, utility locations and installation methods, infrastructure investments, community services, and similar considerations are what planners are trained to bring to the forefront of community discussions about how to prepare for and respond to changing conditions. Moreover, discussions of resilience too often focus on the physical aspects of a community—roads, bridges, homes, businesses, community buildings, hospitals, water and wastewater

plants, and the like. However, social and economic resilience—including a stronger focus on public and individual health—has a greater impact on a community's ability to grow and thrive after a catastrophe; thus, social, economic, AND public health vulnerability identification should be a part of hazard mitigation planning. Planners also have an important role in challenging the status quo by educating elected officials, community leaders, and myriad stakeholders of the necessity of leading and implementing projects that build community resilience.

BENEFITS OF HAZARD MITIGATION PLANNING

Hazard mitigation plans form the foundation of a community's short- and long-term strategy to reduce disaster losses, protect public health, and break the cycle of inappropriate building, disaster damage, reconstruction, and repeated damage. They provide benefits in the form of increased capacity to deal with hazards among stakeholders and the public and improved coordination between different levels of government, nongovernmental organizations, and private businesses. Overall, the hazard mitigation planning process can aid governments at all levels in saving lives, property, and money, speeding recovery from disasters, reducing risks and vulnerability from future disasters, expediting the receipt of grant funding, and demonstrating a firm commitment to improving community health, safety, and welfare. Lastly, having a valid Natural Hazard Mitigation Plan is required to be eligible to receive pre- and post-disaster funds from FEMA.

As part of the long-term strategy, the critical infrastructure—that which is essential for the functioning of the economy and society—must be identified and prioritized for protection and adaptation. This is beginning to be called "Lifeline Planning" and is focused on the critical components of infrastructure necessary to maintaining the social, economic, and public health well-being of communities, not just the physical. Critical infrastructure is comprised of both public and private components (e.g., water, wastewater, power, transportation, communications, food production, schools, etc.) and all must be considered. Given that the type and location of infrastructure developed can either hurt or help resilience goals, it is important that resilience goals be considered in every infrastructure investment. It is critical that siting, specifications, and other factors in infrastructure development and maintenance take climate predictions into account, a goal made increasingly feasible with improvements in climate science and its ability to provide regionally meaningful projections. These investments also need to consider the supply chains necessary to sustain the people, places, and networks that comprise the culture and social fabric of community—how to make them less vulnerable to hazards and more quickly recoverable in the aftermath of a disaster. In the latter situation, restoring regular supply chains can be more important than pushing disaster relief supplies.

A robust hazard mitigation plan aids in community preparedness. The plan should incorporate specific public and private roles and responsibilities across the community and be exercised rigorously and regularly to determine what works well and what needs more work. It is essential that the plan be based on realistic and verifiable facts. For example, if the community has several transportation choke points that make evacuation difficult under perfect conditions, the plan must anticipate the problems and consider remedies for mitigating and managing the incidents that stall evacuation flows—fuel, medical attention, removal of crashes and breakdowns, food and water, rest stops, and so on. Additionally, the plan needs to consider how to meet the needs of a substantial portion of the population that may be unable to evacuate in an emergency and who may be trapped in vehicles and thus remain in harm's way without sufficient water, food, blankets, medicines, and the like—or worse.

The lack of communication and cooperation among various actors in the time before, during, and after disasters is one of the biggest challenges to be addressed in the hazard mitigation planning process. Proper coordination can get infrastructure in place to lessen the impact of potential disasters, it can ensure that resources are in the right locations to respond to disasters, and it can direct aid more quickly to the victims of disasters. Coordination should not just be undertaken among government agencies at the local levels, however. It should instead bring together agencies at the local, state, and federal level, nongovernmental organizations, institutions that provide educational and health services, the media, and any other groups that can assist in preparing for or responding to disasters. Ongoing education, outreach and preparedness activities must incorporate a "whole of community" approach—as defined by FEMA—that communicates both where resources are located and what known risks are present.

Not only are hazard mitigation plans the foundation upon which community resilience is built, they are required for localities to qualify for federal disaster assistance. Finally, studies have consistently shown that investments in mitigation return many multiples of the investment in benefits—at least 4:1 and often much higher.

HAZARD MITIGATION PLANNING PROCESS

The hazard mitigation plan is only the outcome of a process; the process of creating the plan is as important as the plan itself. The planning process includes several key steps that represent important outcomes of their own, such as organizing community resources and assessing hazard risks. FEMA outlines the planning process by identifying four steps:

1. **Organizing resources**—focusing on those that are needed to ensure a successful planning process, such as identifying and organizing community stakeholders and technical experts.
2. **Assessing risks**—identifying the characteristics and potential consequences of the various hazards that could impact a community, with a focus on the impact on important community assets.
3. **Developing the hazard mitigation plan**—determining priorities and identifying strategies to avoid or minimize undesired effects, along with a strategy for implementation.
4. **Implementing the plan and monitoring progress**—ranging from implementing specific projects to changes in day-to-day operations, along with a strategy for keeping the plan current through periodic evaluations and revisions.

But hazard mitigation plans cannot stop there. Hazard planning must now include adaptation to reduce future risks and lifeline/response/recovery planning that results in a more resilient community post-disaster. In fact, the overarching goal of all hazard planning is to enhance community resilience in the aftermath of a future disaster or hazard event. The National Mitigation Framework and the National Disaster Recovery Framework, both developed by FEMA, provide tools to assist localities in the hazard mitigation planning process; however, it is important that the local context and conditions of each community are carefully incorporated into plans for them to be effective. Communities should also make it a practice to report annually on the hazard mitigation plan to assure it is being followed and implemented.

ADAPTATION AND RECOVERY

The American Planning Association and its Chapters and Divisions support the rebuilding of communities that are damaged from disasters to resilient standards that will reduce damage from future events. Communities often want to rebuild their current structures and homes as they previously existed, an understandable reaction in the face of a catastrophic event. However, resilient rebuilding and recovery must consider the likelihood of a repeat of the disaster. While the damage caused by a disaster can be devastating, communities should use the disaster as an opportunity to rebuild in a more resilient manner, such as Greensburg, Kansas, after its 2007 tornado or in areas along the Gulf Coast after Hurricane Katrina (Bay Saint Louis, Mississippi). Planners should guide cities to rebuild for the future fully considering the effects of climate crisis on the duration, intensity, and extent of events. The American Planning Association and its Chapters and Divisions encourage communities subject to recurring hazards resulting from geography to develop post-disaster recovery plans that emphasize the equitable provision of stronger, more resilient buildings in locations less susceptible to a future recurrence of the hazard.

POLICY OUTCOMES

Best Practices Applicable to all Disasters

Effective hazard mitigation planning requires the involvement and cooperation of all levels of government. The proposed policies reflect the need for action across governments. This includes federal, state, tribal, local, regional, and special units of government. References to federal, state and local are intended to be inclusive of all these vital agencies and contributors.

1. Interagency, Regional, and Local Planning Capacity and Cooperation

Sharing resources and ideas before disaster strikes provides for a more expeditious and coordinated response and recovery. Thus, hazard mitigation, adaptation, and recovery are most effective with interagency cooperation. Cooperation between local units of government, regional, state, and federal agencies, and the private and nonprofit sectors is needed to best serve the public and to foster resiliency to all hazards.

The American Planning Association and its Chapters and Divisions support the following policy outcomes:

1.1 Expand interagency partnerships and collaboration such as the Digital Coast Partnership involving public and private partners at all levels. APA supports greater intergovernmental cooperation and data-sharing in the development of hazard mitigation plans. For example, APA supports the elimination of conflicting mandates or policies from various state and federal agencies.

1.2 Provide accurate maps of hazards for all areas of the country that provides more detailed information on the risk of both current and future hazards. Maps need to be updated on a timely basis and made available in easily usable digital formats (e.g., Digital Flood Insurance Rate Maps). Limitations of such maps should be clearly communicated (e.g., FIRMs do not distinguish relative risks within a floodplain).

1.3 Involve all federal mapping agencies in hazards mapping and, to the extent practical, document all hazards and natural resources within a single mapping product or dataset. Silos of data and federal or state interests must be eliminated. Moreover, maintaining the currency and applicability of all mapping products and data sets and making them easily accessible on multiple platforms must be a priority.

1.4 Establish protocols and agency leads among federal, state, and local agencies and nongovernmental organizations to enable better coordination in responses when emergencies arise. This should include, at minimum, all agencies and entities responsible for community resources that are critical to disaster response, including emergency shelters and places of assembly, such as schools and similar facilities:

1.5 Consider likelihood analysis of all potential hazards within regional hazard mitigation plans and reevaluate regularly with consideration to current events, working closely with local emergency planning committees. Also, consider potential compounding disasters based on the most common disasters within your jurisdiction.

1.6 Implement extensive use of technical assistance and training to build local capability to manage natural hazard risk assessments and risk reduction activities and tie in with response, recovery, mitigation, and preparedness planning and grant funding. The technical assistance and trainings should include at least the development of scope of work, use of risk data and engineering analysis, and financial management among various state and federal programs.

1.7 Use the principles of lifeline planning at regional and statewide levels to focus resources on strengthening key transportation routes and critical facilities so that the services necessary to maintain the social and economic structure of communities can be quickly and effectively returned after a disaster.

1.8 Support expanded grant programs for strengthening critical lifeline infrastructure, such as key water, energy, and transportation systems; health care facilities and emergency service providers; and significant employment generators.

2. Interrelationships Between Plans, Development Codes, and Ordinances

By placing greater emphasis on integrating hazard mitigation into state and local plans, development codes and land-use ordinances, some of the negative impacts of disasters will be avoided or reduced.

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

2.1 Establish and expand federal and state mandates and support for state and local comprehensive plans that address hazard mitigation and the land-use impacts of disaster preparation. Technical assistance and funding support may be necessary for smaller units of government.

2.2 Provide funding and technical assistance to educate leaders and future leaders on the importance of hazard mitigation prior to disasters; to conduct robust risk assessments and risk mapping; to use these to reassess land-use plans, zoning ordinances, and other codes for areas of identified risk; and to develop strategies to mitigate those risks.

2.3 Require that state and local Hazard Mitigation Action Plans are integrated into comprehensive plans and remove policies that hinder such integration.

2.4 Enhance state and local building and development codes, perhaps through the International Codes Council (ICC) among others, to require stronger buildings and greater resilience when constructing in identified areas of hazard. Work with federal and state entities and casualty insurance providers to mandate the use of strong and resilient building codes in areas where known hazards are present in order to be eligible to obtain casualty insurance covering the known hazard. Eliminate barriers for local governments that wish to go beyond state and federal building codes in defined hazard areas.

2.5 Require the development of both hazard mitigation and response/recovery plans that include land use and environmental planners as part of the team in addition to emergency management personnel.

2.6 Require effective reporting of state and local resiliency and risk reduction planning efforts to states and FEMA for the purpose of identifying best practices that can be shared, subject areas where additional research emphasis is required, and the best deployment of federal and state resources.

2.7 Support state and local policies and regulations that protect populations in high-hazard areas. This includes policy and regulatory approaches that reduce development pressure in high-hazard and repetitive loss areas.

2.8 Consider regulations that ensure the health and safety of the delivery chain for goods and supplies (e.g., tamper-evident seals on delivery food packages, precautions taken to protect the health of delivery personnel, etc.).

3. Resiliency Standards

The long-term goal of a community is to be able to not only recover from the losses suffered in a disaster, but also to rebuild or redevelop in a way that reduces the potential for future loss while simultaneously ensuring an equitable future condition for all residents. Resiliency standards with proven effectiveness to mitigate disasters should be employed and must fully account for future conditions.

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

3.1 Develop improved resiliency standards appropriate to the hazards faced and incorporate such standards into all federal and state infrastructure investment programs and disaster recovery efforts.

3.2 Ensure that improved resiliency standards focus on economic, social, cultural, and institutional resiliency as well as physical resilience.

3.3 Establish federal, state, and local land-use planning decision frameworks that rely on vulnerability analyses to avoid locating development, especially critical infrastructure and vulnerable populations, in areas subject to risks, to the extent practical.

3.4 Develop, adopt, and enforce building codes that provide greater resiliency toward hazards, including wind, water, wildfire, and seismic damage. In addition to protecting life safety, resiliency standards should aim to maintain building functionality following a disaster.

3.5 Continue to design and invest in infrastructure that helps protect the nation's communities from hazards, as well as protect vital networks from risk.

3.6 Encourage the use of natural and nature-based infrastructure approaches to hazard protection, where appropriate, and use traditional engineered structural solutions to augment those approaches when necessary to protect life and property.

3.7 Encourage the use of redundant, smaller-scale infrastructure over larger-scale infrastructure to promote the resilience of physical networks (such as utility systems, roadways, and waterways).

3.8 Develop standards and incentives and reduce fiscal and legal impediments to install electricity microgrids based on renewable energy sources, preferably with energy storage, that can provide electricity for critical infrastructure and needed support services during periods of power outages and intentional shutdowns.

3.9 Research the legal, financial, ethical, public health, and equity issues of managed retreat away from areas of high hazard to more resilient locations and plan for such where appropriate and feasible.

3.10 Plan for a healthy, safe, and adequate supply of housing for all economic segments is a key feature of community resilience together with education, access to employment, health care and healthy living options, and transportation resources.

3.11 Use resilience as a guiding principle in land-use decisions through the comprehensive planning and zoning/development code processes.

3.12 Ensure that resiliency and sustainability principles are integrated into capital planning programs at the federal, state, and local levels.

4. Incentives

Incentives or disincentives, properly applied, can support informed investment decisions in ways that may be more effective than regulation alone. The National Flood Insurance Program inadvertently incentivized building or remaining in risky locations by offering a significant insurance rate subsidy. Thus, recent reauthorization efforts have focused on reducing or eliminating the gap between premium cost and actuarial risk.

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

4.1 Reduce or eliminate regulations, policies, and incentives that encourage (either intentionally or unintentionally) development or redevelopment in known hazard-prone areas or areas that are projected to be vulnerable to hazards.

4.2 Provide tax credits or other incentives at federal, state, and local levels for work done to improve the resiliency of structures in hazard-prone areas.

4.3 Include within disaster assistance funding 100 percent of the cost of meeting enhanced resiliency standards.

4.4 Offer one-time buy-out bonuses at greater than the full cost of relocating away from high-hazard areas to encourage property owners not to rebuild, elevate, or repair damaged structures. Tie the availability of continued federal and state casualty insurance to such offers.

4.5 Support programs and policies that maintain the stability and long-term viability of hazards insurance programs (such as flood, wildfire, and wind insurance). As premiums rise to reflect their true risk, APA supports research into means testing and other options or methods that may reduce the financial impact on low- to moderate-income residents, and to communities that may be significantly affected by higher premiums; however, care must be taken to avoid incentivizing risky choices by those who can least afford the consequences.

4.6 Ensure that equity components are an essential part of incentives and that points for achieving equitable outcomes are incorporated into the scoring rubrics of competitive incentive programs.

4.7 Support federal, state, and local programs that incentivize planning and preparedness such as the U.S. Bureau of Reclamation's WaterSMART program.

4.8 Consider how mortgage, housing, and community development programs associated with the federal government could be used to provide incentives for low-risk development and communities.

5. Stakeholder Involvement and Engagement

Stakeholder involvement brings varying viewpoints, concerns, and skills to hazard mitigation plans and infrastructure projects. The resulting plans and investments are more comprehensive, more successful in implementation, and less likely to succumb to the vagaries of shifting political winds. Engagement is a continuing endeavor, not a one-time event. Moreover, planners have an ethical obligation to ensure that planning processes and outcomes equitably address the needs of vulnerable and traditionally underrepresented populations and business enterprises. It is essential for engagement, education, and outreach efforts to include a particular focus on historically marginalized communities and those lacking adequate technology resources.

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

5.1 Fully incorporate planners and other community partners in the hazard mitigation planning process on an ongoing basis as an integral and permanent part of the process to facilitate monitoring of implementation and updates in real time, among other things.

5.2 Consistently engage residents equitably, including residents of historically marginalized communities; business professionals; public and private health care and social service agencies; religious and community leaders; educational institutions; youth; and other similar stakeholders in the planning process in order to incorporate economic, social, and institutional resiliency into mitigation plans. Encourage stakeholders to use mitigation plans in their own continuity of operations planning. Support engagement of disadvantaged business entities and small business in general.

5.3 Develop regional partnerships and civic engagement in mitigation and adaptation planning.

5.4 Develop inclusive and intentional engagement activities for historically excluded residents for greater shared community resiliency and overall enhanced hazard mitigation planning process.

5.5 Require that hazard mitigation plans document public involvement of socially vulnerable populations and mitigate the disparities in both exposures to hazardous events and in the recovery from disasters.

6. Public Education and Communication

For hazard mitigation efforts to be successful, the public must understand the need to change where we build, what we build, and how we build. People continue to base reactions to disasters on personal experiences; thus, it is necessary to have available data (including historical and scientific data) and resources to convey the potential for one or more hazardous events and provide alternatives and options for how the community can best prepare.

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

6.1 Increase federal and state support for research and dissemination of data on the magnitude, frequency, vulnerability risk, and location of natural and human-caused hazards and risks.

6.2 Encourage and support the development of web-based interactive data, mobile device apps, and social media to engage a wide spectrum of the public, including multiple generations of users.

6.3 Continue the development of robust hazard notification systems that reflect the current diversity of communication devices used by residents and visitors, remembering that not all persons affected by a disaster will have access to the latest technology. nor will they necessarily have extensive local knowledge.

6.4 Educate the public, with a focus on historically underserved or marginalized groups, before disasters on individual/family and small business hazard preparedness; the essential community responses planned for water, ice, and food distribution; and available assistance for vulnerable and protected populations. Encourage and assist residents to plan for self-sufficiency following a major event. Support educational efforts through the public schools and curricula.

6.5 Educate the public, with a focus on historically underserved or marginalized groups, on the risks associated with building and living in hazard-prone areas and require all real estate purchase and lease transactions to disclose to the buyers and tenants both the history of hazards and the mapped or predicted hazards for the property being purchased or leased. Educate real estate professionals on how to find and how to provide customers with the most up-to-date information on hazard-prone areas.

6.6 Develop and utilize grassroots networks to help prepare residents for disasters and recovery at a neighborhood or communitywide scale. Examples include Community Emergency Response Teams, Community Outreach Promoting Emergency Preparedness networks and Resilience Hubs.

6.7 Establish clear communication protocols across all levels of government that identify for each type of disaster a lead agency for disseminating information to the public regarding response, recovery, and mitigation.

6.8 Invest in digital infrastructure to ensure equitable access to all communication on hazard mitigation data and education for preparedness programs and allow the provision of broadband and internet services by governments and nonprofit organizations.

7. Environmental Considerations

Natural and nature-based solutions, including green infrastructure and planning for co-benefits, when properly used, can be cost-effective methods for mitigating the effects of natural hazards while also supporting other community objectives. Communities should strive to advance environmental justice and balance environmental and community economic considerations to ensure that their hazard mitigation planning will be successful and effective.

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

7.1 Increase federal and state research into the effectiveness of natural and nature-based solutions and identify techniques appropriate to specific regions and hazards faced.

7.2 Support federal, state, and local tax incentives to utilize environmentally sensitive building and development techniques.

7.3 Support collaborative efforts to improve environmental resilience for critical infrastructure systems using adaptive energy and resource (e.g., water) conservation approaches.

7.4 Support opportunities to repair environmental damage from previous development and restore natural habitats that can buffer communities from the effects of future disasters.

7.5 Enhance federal, state, and local tax credits for conservation easement acquisition based on the ecological values and ecosystem services protected and preserved through the easement, including the ability to reduce risks from natural hazards.

7.6 Establish a national catalog of green infrastructure best practices and successful case studies of mitigation and adaptation, including benefit-cost analyses to assist planners, floodplain managers, hazard mitigation specialists, fire protection agencies, and others considering local plans and policies. The Naturally Resilient Communities website produced by The Nature Conservancy (with APA support) provides an example for moving in that direction.

7.7 Support investments to restore ecosystem and environmental health in the aftermath of disasters.

7.8 Develop appropriate factors to allow natural and nature-based solutions to compete on an equal footing with structural solutions in benefit-cost analyses produced by the U.S. Army Corps of Engineers, Federal Emergency Management Agency, and other federal and state agencies.

7.9 Encourage, where practical, the creation of wetlands and other nature-supportive features on lands acquired as part of mitigation efforts.

7.10 Recognize the impacts of disasters on wildlands and wildlife and ensure that hazard mitigation planning considers appropriate response and recovery measures for wildlife.

8. Response/Recovery Efforts

Rebuilding communities that are damaged from disasters must be done in a manner that will reduce the severity of future hazard events. The impulse to simply replace in place what was destroyed is an understandable reaction to a devastating event, but often short-sighted. While the damage caused by a disaster can be devastating, communities should use the disaster as a learning opportunity to rebuild in a more resilient and equitable manner. Planners should guide communities to minimize the severity of, and potential for, disaster recurrence. This approach applies to all kinds of hazards but is particularly important for hazards that are known to recur in specific locations, such as flooding and beach erosion.

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

8.1 Champion federal and state action to make response/recovery plans developed with extensive stakeholder and public input a mandatory component of community hazard mitigation plans. It is far better to do such "blue sky" planning well before disaster strikes so that recovery is more quickly implemented and dovetails with other community plans.

8.2 Support federal and state action to provide adequate funding resources to build to higher standards or to relocate structures based on reasonable assumptions about current costs. APA supports research into other financial options for such assistance, such as low-interest loans, which should be prioritized for historically disadvantaged groups, communities of color, and other low-income populations.

8.3 Encourage federal and state agencies to adopt policies that will speed and streamline response/recovery efforts that allow for innovative and resilient rebuilding efforts; make "better" the preferred alternative and "same" the more difficult path to follow. Adopting a pre-disaster recovery ordinance to guide both management and policy outcomes in recovery, as suggested by APA's model ordinance in the Planning for Post-Disaster Recovery: Next Generation project, is a way to codify a commitment to achieving such outcomes.

8.4 Encourage communities to plan and adopt appropriate emergency land-use tools in advance of disasters to address displacement issues and guide community reconstruction to less vulnerable locations using more resilient standards. Such strategies could include using temporary moratoria when appropriate, making provisions for temporary housing and businesses, or using more comprehensive programs like transfer of development rights.

8.5 Support development and implementation of real-time disaster warning systems with built-in redundancy to reach all segments of the community, including those with limited communication technology and non-English speakers.

8.6 Require—where appropriate—all new public schools and similar community buildings to be designed, constructed, and equipped to serve as short-term emergency shelters during and in the immediate aftermath of a disaster. Building features to consider include the ability of the building to have on-site emergency power generation and battery storage sufficient to keep HVAC, refrigerators, freezers, lights, water and wastewater, medical and communication equipment, and all other essential systems functioning for up to seven days. Specific design parameters must be adjusted for the specific type(s) of hazards faced by the community as well as the availability of other community resources available to meet emergency shelter needs. Consider a new federal grant program to assist with the added costs of construction. Foster regional collaboration with hotel, fuel, food, and retail business communities to engage them in planning for their potential role during large-scale emergencies.

8.7 Develop public outreach and education strategies for both pre- and post-disaster conditions to assist with social recovery from devastating and catastrophic events. As disasters traumatize whole communities, not just individuals, develop a framework and resources for emotional resiliency among residents to allow communities to rebuild in a way that is better than it was before the event. Consider employing the concept of Resilience Hubs to support local resident needs and coordinate resource distribution and services during disaster response and recovery.

8.8 Encourage communities to plan for support of animals (domestic pets and livestock) in advance of and following a major event. Focus on public outreach to provide information and education on steps necessary to protect animals and maximize opportunities and flexibility for sheltering animals as well as a coordinated network to connect lost animals with their families.

8.9 Encourage comprehensive and cross-sector evacuation planning where appropriate to the hazards faced in the community. Consider a full range of community services and facilities available, including use of school buses and similar transportation networks, likely mass evacuation routes, and potential shelter-in-place locations.

8.10 Support programs and policies to fund ongoing operating costs for businesses whose operations are interrupted or otherwise adversely impacted by hazards for a period of time until recovery is broadly considered to be achieved.

8.11 Encourage state and local communities to develop plans for receiving and distributing federal response, recovery, or stimulus dollars as part of state mitigation plans.

8.12 Encourage targeted application of the interagency National Disaster Recovery Framework for all major disaster declarations that triggers federal aid to enhance and inform specific recovery guidance and potential funding not otherwise available to communities.

8.13 Plan to address the needs of people experiencing homelessness and other vulnerable populations for the duration of emergencies. This may include provisions for food distribution, emergency shelter, etc. Maintain a database of potential partners who are experienced in delivery of such services who can be called upon in an emergency.

8.14 Maintain adequate post-disaster debris management plans addressing all critical elements of debris removal, including clearing streets, prenegotiated contracts for pickup and disposal, designated disposal sites, opportunities for environmentally safe recycling, demolition of unsafe buildings, disaster debris prevention strategies, and safe handling of hazardous materials. Regarding vegetative debris, seek out the involvement of professional foresters to determine the viability of damaged trees to avoid unnecessary decimation of the urban forest, but also, in forested areas, to eliminate potential fuel for future wildfires.

Best Practices Applicable to Specific Types of Disasters

It is common to distinguish types of disasters between natural and human caused (or technological or malevolent) in origin. In part, this comes from distinguishing between "acts of God" versus intentional acts. It also comes from the source of statutory authority to prepare and review mitigation plans. FEMA typically reviews plans for natural hazards (flooding, winds, etc.), while local police and emergency management personnel are involved in responding to human-caused disasters (e.g., hazardous materials, terrorist acts, etc.). Planners can and should have a role in each type of disaster.

The term "natural disaster" is widely used and has accepted meanings, but it has also been challenged on the grounds that disasters are largely of human making even if they stem from natural forces, typically of meteorological or geological origins. Gilbert White, one of the founders of the field of floodplain management and an early and long-time expert on natural disasters, once said, "Floods are 'acts of God,' but flood losses are largely acts of man." What White meant is that floods are a known natural phenomenon, but human decisions are responsible for placing property and lives in harm's way. This point is perhaps well illustrated by the tragic deaths that occurred in nursing homes in parts of Florida when they were left without electricity in the aftermath of Hurricane Irma in 2017—when such facilities located in a hurricane-prone geography do not have sufficient emergency power generation capacity to maintain medical equipment, air conditioning and food refrigeration, what began as a natural disaster became a human-caused disaster. While this Policy Guide uses the terminology of "natural disaster," White's point is important with respect to where and how communities build and rebuild. Moreover, that point applies equally to earthquakes, wildfires, tsunamis, and other natural phenomena that tend to be tied to specific geographies. APA accepts the common wisdom that natural hazard mitigation is a function of both how and where communities and structures are built. Land-use decisions and building codes, among other policy options, play a role in reducing the loss of lives and property in various kinds of natural disasters. It is the role of planners to access the best science available on these issues, including climate change, and help integrate that knowledge into plans, programs, and policies to foster wise public policy decisions.

Planners also play a role in addressing human-caused disasters by addressing land-use and other decisions that can affect the risk and vulnerability to specific disasters. For example, risk and vulnerability to incidents such as the fertilizer explosion in West, Texas, could have been mitigated by better land-use decisions regarding potentially hazardous facilities and vulnerable sites such as schools and nursing homes, as well as better fire codes to minimize the risk of explosions.

The specific detailed statements concerning Policy Outcomes for specific categories of natural and human-caused disasters are intended to reflect that approach and those priorities.

NATURAL DISASTERS

9. Disease/Pandemic

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

9.1 Ensure that interdisciplinary teams of public health experts, physicians, community health workers, scientists, media, and communications professionals are in place to help build local, state, and federal capacity to recognize and manage critical public health and safety issues, including disease/pandemic outbreaks, immediately following detection.

9.2 Develop national, state, and local communication plans for consistent and timely public health information on the appropriate individual and business responses to disease outbreaks and pandemic events. Use all communication channels available, including social marketing, to encourage behavior changes needed during a public health crisis.

9.3 Require that plans for pandemic response recognize that disease outbreaks and pandemics will exacerbate existing economic, social, and health outcome inequities. Planning to mitigate and respond to these public health emergencies must make special efforts to address these inequities. For example, protections for housing and economic security must address the needs of vulnerable populations and communities of color. Mitigating economic impacts and protecting public health must be done equitably so that vulnerable populations do not bear the brunt of disease exposure and health risks.

9.4 Ensure that federal, state, and local plans are in place and exercised for managing pandemics, including the potential for economic disruption (including protection of housing), widespread shelter-in-place orders robust information technology, increasing hospital and health care system capacity, and an associated increase in fatalities.

9.5 Plan to adequately address the digital divide to ensure equitable access to essential services such as schools, social, and economic assistance, and public governance for the duration of public-health related shutdowns (e.g., installing public hotspots, etc.). Remove barriers to government and NGO/nonprofit provision of digital access services.

9.6 Ensure that plans are in place to adapt to shutdowns or modified operation of public services, including school closures and public transportation disruptions, and plan to ensure the safe use of public open space for the duration of such restrictions.

9.7 Develop interagency logistical plans and partnerships between government at all levels and the private sector to protect against disruptions in supply chains for critical food supplies and medical equipment, testing, and treatments. Identify and coordinate with industries that do, or can, provide medical equipment or other supplies.

9.8 Ensure appropriate stockpiles of vital equipment are in place (e.g., Personal Protective Equipment) and have plans for materials to be allocated equitably. Protect the health and safety of the supply chain.

9.9 Ensure adequate personal protective equipment, housing and daycare/schooling facilities are provided for essential personnel and their families.

9.10 Recognize that many common community features and amenities can become even more vital during a disease outbreak or pandemic. For example, bike lanes and wider sidewalks accommodate social distancing, public restroom facilities can be designed to be cleaned and remain open in an emergency, and regional parks and parklets can provide essential outdoor recreation opportunities during public health-related shutdowns.

9.11 Strengthen the ability of the Centers for Disease Control to conduct surveillance of human and animal viruses and risk assessments of viruses with pandemic potential.

9.12 Enhance federal, state, and local investments in infrastructure and regulation to protect water and food sources from contamination and effectively remove disease-carrying vectors to the extent practical.

9.13 Support and help fund the protection of waterways and other conduits of disease or contamination from causing future exposure to assist with community compliance with America's Water Infrastructure Act (AWIA) and other laws and programs.

9.14 Ensure protection from zoonotic illness through collaboration with Centers for Disease Control and Prevention's One Health Initiative.

9.15 Enhance federal, state, and local plans to prevent plant disease, insect infestations, and vermin depredation regarding disease and/or risk of famine.

9.16 Ensure flexible and direct federal support to maintain the fiscal stability of state and local governments and related municipal finance markets as an essential element of frontline response and recovery.

10. Drought

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

10.1 Ensure that all states and communities have the regulatory authority to require water conservation in the planning and development process. Measures could include restricting spray irrigation, water-efficient landscaping requirements, and ensuring that new development relies on proven, rather than assumed, water supplies.

10.2 Support federal, state, and local tax credits or other incentives and grants for retrofitting existing development with water-conserving plumbing and water-efficient landscaping.

10.3 Require that states and local or regional jurisdictions develop drought contingency and management plans, preferably on a watershed basis, that include a vulnerability assessment across sectors, identify mitigation actions to address those vulnerabilities in advance of a drought, and identify response actions (e.g., emergency conservation) and the triggers for implementation of those response actions.

10.4 Support stronger federal and state roles in the development of integrated, full-watershed water management plans.

10.5 Support communities in developing drought-resistant infrastructure that is designed to withstand the physical demands of a drought environment, while ensuring adequate pressure to meet household, industry, and firefighting demands and minimizing loss due to broken or leaking lines.

10.6 Require local, regional, and state hazard mitigation plans to address and to acknowledge the full impacts of drought as often drought is the lead problem of a potential series of cascading hazards that can exacerbate existing hazards including wildfire and flooding, e.g., through inhibiting soil's absorption of heavy precipitation, which can lead to flash floods and landslides.

10.7 Continue research into and federal support of water recycling, wastewater reuse, groundwater recharge, aquifer storage and recovery, reconnecting groundwater to surface water, and other methods to allow integrated water availability to occur. Water resources planning based on "One Water" concepts maximizes options, especially during times of drought.

10.8 Support local programs that encourage water conservation and reuse and protect critical environmental elements by providing data to customers via dashboards and portals that can motivate customers to adjust behaviors in real time to support broader goals such as emergency conservation response actions.

10.9 Support federal interagency engagement regarding the portfolio of programs and resources available to states and local entities to prepare for and address drought. The coordination would provide a clear picture of the resources available across the federal government to prepare for and address drought.

10.10 Support the implementation of training exercises across the state and local governments regarding drought (similar to emergency management exercises) to increase internal communication and understanding regarding drought risks and the tools which are available.

10.11 Use water pricing to signal its value to industrial, agricultural, commercial, and residential users. Subsidize low-income residential water users as necessary to ensure their access.

10.12 Include utility planning and management to optimize real water losses, especially in drought-prone and arid areas.

11. Earthquakes, Landslides, and Geologic Hazards

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

11.1 Support federal, state, and local mapping of fault zones, landslides, and liquefaction areas as a part of larger all-hazards mapping efforts.

11.2 Expand funding for seismic research and investment in the next generation of seismic activity prediction, detection, and warning systems, including in areas where hydraulic fracturing is occurring.

11.3 Continue research into location and building standards for structures located in seismically active areas, including strengthening building codes by requiring that shaking intensity and duration be considered and ensuring that not only will life safety be protected, but building functionality can be maintained following an earthquake.

11.4 Support state and local retrofit programs that use best engineering standards for structures located in seismic zones.

11.5 Recognize the potential of earthquake-induced landslides in land-use and development plans.

11.6 Avoid new development in landslide-prone areas.

11.7 Require that local plans and codes in seismically active areas include identification of fault zones, fault setbacks, and seismic construction standards that are specific to the seismic risks faced (e.g., liquefaction versus bedrock movement).

11.8 Use the principles of lifeline planning at regional and statewide levels to focus resources on strengthening key transportation routes and critical facilities so that the services necessary to maintain the social and economic structure of communities can be quickly and effectively returned after a seismic event.

11.9 Support expanded grant programs for strengthening critical lifeline infrastructure, such as key water, energy, and transportation systems; health care facilities and emergency service providers; and significant employment generators in seismically active areas.

11.10 Provide grant funding and tax incentives to encourage strengthening and retrofiting existing structures in seismically active areas.

11.11 Encourage continued research into the risk of seismic activity as a result of human actions, such as hydraulic fracturing and deep well injection, and promote regulations that minimize and prevent the risk of human-caused seismic activity.

11.12 Support groundwater management legislation where the long-term extraction of ground water has created the potential for the land to settle and subside, putting critical infrastructure and other development at risk and permanently reducing groundwater storage capacity.

11.13 Encourage local and regional land-use and comprehensive plans to include locations of levees and dams on maps and note vulnerability to land subsidence and earth fissures that could result in failure of the structures.

11.14 Increase research for early detection, monitoring, and mitigation of earth fissure development to reduce the risk to dams associated with earth fissuring.

11.15 Increase research into the geological conditions and human causes contributing to sink holes and land subsidence and provide data to communities for use in local planning.

12. Extreme Heat/Cold

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

12.1 Ensure that state and local plans are in place to manage extreme heat/cold events, especially when power outages accompany the extreme temperature event. All such plans must include the emergency health care providers within a community and region.

12.2 Encourage the use of landscape and hardscape design in combination with building placement and green buildings to create spaces and communities that mitigate the impacts of extreme heat events.

12.3 Ensure that local communities have adequate shelter facilities with properly trained coordinators and/or managers that can address the needs of at-risk populations such as the elderly, the homeless, the disabled, and families.

12.4 Ensure that local communities have an adequate monitoring system for house-bound at-risk populations.

12.5 Support state and local agencies developing working relationships with utilities so that socially vulnerable populations do not have utilities cut off for non-payment during extreme heat/cold.

12.6 Ensure that all new and substantially remodeled publicly supported housing construction provides both heating and cooling systems that are designed for and applicable to both the existing and projected climate.

13. Flooding

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

13.1 Develop predictive flood map products—at least 50 years into the future—that account for sea level rise, land subsidence, and urban and riverine flooding caused by stormwater runoff from storms of increasing frequency, duration, and intensity. Once developed, maintain the currency of the map products with regular updates at no less than five-year intervals.

13.2 Revise and adopt federal and state flood regulations that apply to the 500-year (0.2 percent annual chance) floodplain to reduce the effects of future flooding events and, in coastal communities, of sea level rise. For example, Norfolk, Virginia, requires the lowest habitable floor of new construction in the 500-year floodplain to be 18 inches above highest adjacent grade.

13.3 Ensure that flood insurance standards eliminate incentives for rebuilding in hazardous areas and focus on relocating away from high-hazard locations. Where relocation is not possible, insist on adopting standards that do not simply reduce risk, but focus on eliminating catastrophic damage to the maximum extent possible.

13.4 Develop and implement standards that impose higher flood resilience standards for public and private critical infrastructure.

13.5 Support the most current climate science. Consider multiple alternative climate scenarios when updating both maps and regulations.

13.6 Implement an expedited effort to provide detailed mapping to areas not yet mapped or inadequately mapped by the NFIP. Too often, these more rural areas become weak links in the regulatory chain as subdivisions move into previously undeveloped areas, especially outside municipal boundaries exacerbating downstream flooding.

13.7 Work to reform the NFIP to place it on a sustainable financial footing. If there are subsidies built into the program, limit them to equitable need-based means-tested approaches. Consider a requirement that flood coverage must be included in all standard property casualty insurance policies with the federal government role limited to serving as the reinsurer of last resort.

13.8 Extensively market the availability of the contents insurance for renters that is available through the NFIP.

13.9 Expand the use of the Community Rating System by encouraging communities to map and regulate flooding hazards at higher standards than required by FEMA; consider offering incentives that accrue to the locality itself and not simply the ratepayers.

13.10 Advocate for adequate federal and state funding to build to higher flood resiliency standards or to relocate structures based on reasonable assumptions about current costs. For example, FEMA's current Increased Cost of Compliance allowance in the NFIP is often insufficient to cover the costs of elevating a residence. This should include research into other financial options for such assistance, such as low-interest or zero-interest loans or loan repayment upon the sale of the property.

13.11 Ensure that the true risks of building behind levees are accounted for in the NFIP and by communities considering locating development behind levees in the mistaken belief that levees have rendered such areas "safe."

13.12 Ensure equitable treatment of all communities, especially those of color, economically disadvantaged and socially isolated populations, and other vulnerable communities before, during, and after a decision to relocate away from flood-prone areas. Moving the entire community as a community to a reduced risk location will maintain social ties and interpersonal and business connections and should always be the preferred option. It is also critical that the capital equity of the individuals and families be preserved (e.g., if owned no mortgage debt in current location, the relocation must also be owned with no mortgage debt).

13.13 Advocate for watershed-wide plans that cross jurisdictional lines and interagency cooperation, at all levels of private and public sectors, in data sharing. Require upstream land-use authorities to consult with downstream communities within a watershed such as when setting policies or adopting regulations that could impact the volume or velocity of runoff from design storms.

13.14 Ensure adequate funding for and expedite permitting of stream gages and hydrologic modeling, especially in communities with repetitive flood events or repetitive (flood) loss structures.

13.15 Promote adoption of greater freeboard above base flood elevation.

13.16 Encourage localities that have experienced flooding outside of the mapped SFHA to expand local floodplain regulations to areas of actual flooding during the most severe flood on record.

13.17 Advocate for the creation and broader use of nonregulatory flood risk and communication mapping products, such as flood depth grids, floodwater velocity grids, channel migration or fluvial hazard zone mapping and risk probability grids, through the FEMA Risk Mapping, Assessment and Planning program to better understand and inform community offices and the public.

13.18 Work with nongovernmental organizations and others to develop apps that crowdsource data from flood events; use that data together with remote sensing data to improve flood mapping products and flood warning systems. For example, the Woods Hole Oceanographic Institution, in partnerships with the towns of Nags Head and Duck, North Carolina, have developed the iFlood app to allow the submission of "citizen-scientist" flood reports.

13.19 Support increases in federal funding to repair, replace, or upgrade septic systems in flood zones or to connect to municipal wastewater systems and provide opportunities for local regulations and rulemaking pertaining to on-site wastewater systems that will allow local conditions to be considered.

13.20 Support implementation of No Adverse Impact Standards for floodplain management.

14. Hurricanes and other Tropical Storms

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

14.1 Ensure continued funding for next-generation weather satellites and terrestrial National Weather Service infrastructure to improve detection and prediction capabilities of tropical cyclones as well as to more accurately model localized impacts of flooding. Avoid radio frequency bandwidth overlaps that could diminish the efficacy of weather satellite data downlinks.

14.2 Increase technical and fiscal assistance to coastal communities and adjacent inland communities in planning for and implementing measures to mitigate the impacts of tropical storms.

14.3 Strengthen protection for coastal primary dunes and wetlands that help protect inland areas from storm surge, including allowing acquisition of such areas through eminent domain.

14.4 Require at-risk communities to develop and adopt evacuation plans in concert with emergency services providers. Inform and prepare the public, especially economically and socially isolated residents, using a full range of communication and interaction methods. Ensure that coordination with receiving communities on shelter needs is part of the evacuation plan development process.

14.5 Expand funding for research into the effectiveness and benefit-cost ratios of various adaptation and mitigation strategies including both natural areas preservation and man-made interventions (e.g. beach nourishment, vegetation maintenance, and engineered structures).

14.6 Strengthen building codes to use predictive wind and water models for new construction instead of historical models.

14.7 Establish federal and state grant programs to allow all new public buildings in coastal communities including public schools, public libraries, and other places of public assembly to be designed, constructed, and equipped to serve as emergency shelters during and in the immediate aftermath of tropical cyclones and tsunamis. At a minimum this should include substantial freeboard and the ability of the building envelope to withstand a Category 3–5 storm event and have sufficient on-site emergency power generation to keep heating-ventilation-air conditioning, refrigerators, freezers, lights, water and wastewater, medical and communication equipment, and all other essential systems functioning for up to seven days.

14.8 Analyze the resilience benefits of requiring all new electric distribution systems to be placed underground in coastal areas subject to high wind events and, in those locations where undergrounding of utilities is determined to have substantial resilience benefits, institute such a requirement and provide financial incentives to both electric utilities and property owners to relocate existing overhead service and distribution lines underground.

14.9 Develop a common terminology to be used across all governmental entities and NGOs to identify evacuation zones, flood zones, safe/unsafe parking zones, and similar spatial designations to avoid overlap and public confusion.

15.8 Develop a comprehensive program of grants, tax credits, and other financial incentives to assist local communities with strategic and managed retreat in the face of changed climate conditions and coastal sea level rise. Such programs must consider the removal or relocation of public infrastructure as part of managed retreat.

15.9 Ensure that equitable treatment of communities of color, socially isolated individuals, and economically disadvantaged populations in situations of managed retreats includes full preservation of both individual and community capital equity in relation to before-and-after conditions as well as the opportunity to remain connected and together as a community.

15. Sea Level Rise and Coastal Land Subsidence

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

15.1 Expand funding at the federal and state level for continuing research using current climate science to determine the most likely scenarios—including worst-case analysis—for sea level rise and land subsidence on coastlines over the next 100-plus years.

15.2 Require federal and state action to ensure that current research data is used in community plans and that the most likely scenario is within the plan and the worst-case scenario drives decisions about locating critical infrastructure and land uses. Support local government efforts to do this even in the absence of federal or state actions.

15.3 Investigate the role that natural resource restoration plays in protecting communities from sea level rise, and support appropriate solutions at the local, state, and federal levels.

15.4 Require infrastructure projects in coastal areas to include an estimate of potential sea level rise and to prove the engineering design accounts for those projections before granting federal funds.

15.5 Develop economic modeling tools to estimate the financial impacts of sea level rise.

15.6 Support research and development of new building and foundation types that allow structures to rise and fall as water rises and falls.

15.7 Encourage local and regional long-term visioning efforts and strategic planning in and around communities threatened by sea level rise that consider a range of alternatives, including adaptation and strategic, managed retreat from the shoreline. Tested tools such as transfer of development rights can be adapted to ease the financial and fiscal issues of managed retreat.

16. Tornadoes, High Winds, and Severe Thunderstorms, Severe Dust Storms

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

16.1 Continue funding next generation weather satellites and terrestrial National Weather Service infrastructure to improve severe weather and tornado activity detection and prediction capabilities. Avoid radio frequency bandwidth overlaps that could diminish the efficacy of weather satellite data downlinks.

16.2 Promulgate, implement, and enforce wind-resistant building codes to improve the safety and resilience of future construction in the face of EF0–EF3 tornadoes and high winds associated with other weather events. Support local requirements for even higher levels of protection based on local predictive modelling.

16.3 Use the best and most current climate science for identifying areas that are at risk from high wind events within which hazards mitigation planning must robustly consider resilience measures.

16.4 Analyze the resilience benefits of requiring all new electric distribution systems to be placed underground in areas subject to high wind events and, in those locations where undergrounding of utilities is determined to have substantial resilience benefits, institute such a requirement and provide financial incentives to electric utilities, developers, and property owners to relocate existing overhead service and distribution lines underground.

16.5 Fund research at the national level to develop advanced technology that links safe rooms and community shelters to warning sirens and opens doors, activates cameras, and operates ventilation systems based on actual and impending tornadic activity.

16.6 Establish a national requirement, coupled with national grant or revolving loan programs, that all public schools, public libraries, and other places of public assembly be equipped or retrofitted with high wind- and tornado-safe rooms. In locations where flooding is an identified hazard, safe rooms must be located and designed to prevent inundation.

16.7 Champion increased funding (or continued funding) for stand-alone safe rooms in rural areas to prevent the future loss of life.

16.8 Consider banning the use of mobile homes in high-wind hazard areas until and unless the building codes for such units, both in manufacturing and site anchoring, are revised to produce units resilient to high winds and low to moderate tornadic activity. Ensure that an adequate supply of affordable housing alternatives is available to low-income community members.

17. Tsunamis and Seiches

The American Planning Association and its Chapters and Divisions support the following policy outcomes:

17.1 Mandate that land-use plans in coastal areas consider the risk of tsunamis and mitigate potential hazards arising from that risk; increase technical and fiscal assistance for this effort.

17.2 Support federal, state, and local mapping of tsunami risk areas, and lakes and reservoirs at risk of seiches.

17.3 Encourage the development of building and land-use standards for areas at risk of seiches.

17.4 Support the identification and signage of tsunami evacuation routes and the deployment of tsunami warning systems.

17.5 Prohibit all critical facilities from locating within tsunami inundation zones and harden water dependent facilities such as a shipping terminals.

18. Volcanic Eruptions

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

18.1 Expand funding for volcanic research and invest in the next generation of volcanic activity detection and prediction monitors.

18.2 Increase public awareness of volcano hazards, especially in geologically active areas with historically low volcanic activity.

18.3 Develop and widely publish evacuation routes and evacuation protocols in all regions with potential volcanic activity.

18.4 Support the preparation, and periodic update, of Volcanic Hazard Zone Maps by the U.S. Geological Survey to serve as a guide for planning and land-use decisions.

18.5 Discourage development in areas prone to volcanic activity through zoning and land-use regulations.

18.6 Develop maps that identify potential areas or zones where population, buildings, and infrastructure may be at risk of damage or destruction. Depict areas where gaseous plumes and other dangerous volcanic emissions may occur.

18.7 Support the use of planning tools, such as comprehensive plans, zoning codes, and subdivision ordinances, to reduce development pressure in disaster-prone areas and incentivize development in the least hazardous areas.

18.8 Maintain and improve fire and fuel breaks.

18.9 Require multiple and adequate ingress and egress routes to vulnerable areas to provide "lifelines" that allow safe evacuation and deployment of emergency services during a lava flow event or eruption and to support rapid restoration of economically and socially supportive services and functions.

19. Wildfires

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

19.1 Support wildland fire management policies and practices that recognize the ecological importance of fire in the landscape, especially the role of fire in reducing wildland fuel loads.

19.2 Initiate, support, and require ignition-resistant policies and standards for homes and other structures in wildfire-prone areas and the wildland-urban interface.

19.3 Require vegetation management ("defensible space") policies and standards, especially in the wildland-urban interface, that align landscaping practices with wildfire risk reduction and ecological objectives and encourage the development of incentives for full compliance.

19.4 Strongly support development of Community Wildfire Protection Plans and adoption of the principles and methods recommended in the National Fire Protection Association Firewise USA program.

19.5 Require that community planning and capital plans include multiple and adequate ingress and egress routes to vulnerable areas to provide "lifelines" that allow safe evacuation and deployment of emergency services during a wildfire event and to support rapid restoration of economically and socially supportive services and functions.

19.6 Require that developments are built to incorporate adequate access, water supplies, and other public and emergency response safety standards.

19.7 Mandate that land-use plans for communities with wildland-urban interface areas include both mapping and wildfire hazard data to identify the risk of wildfires and mitigate potential hazards arising from the risk.

19.8 Support the use of planning tools, such as comprehensive plans, zoning codes, and subdivision ordinances, to reduce development pressure in wildfire-prone areas and incentivize development in the least hazardous areas.

19.9 Support a systematic approach to wildfire risk assessment to identify community vulnerabilities based on fire behavior science and involving both fire protection professionals and planners.

19.10 Fund research into and support the maintenance and hardening of the electrical grid to minimize wildfire ignition potential; strategies include appropriate and aggressive vegetation management around electric lines, undergrounding where feasible, and use of microgrids for enhanced resiliency.

19.11 Develop, with considerable public input to ensure equity and fairness, plans and procedures for electric utilities to use when considering temporarily deenergizing overhead transmission and distribution lines for the purpose of removing a potential source of wildfire ignition during periods of heightened wildfire risk.

19.12 Consider planned power outages as an interim wildfire mitigation strategy only where less disruptive measures are not feasible and only after appropriate steps are taken to minimize impacts to those who rely on powered medical equipment as well as those who are economically and socially vulnerable.

19.13 Require all telecommunication systems components in wildfire-susceptible locations to provide battery backup which will maintain systems for at least seven days in the absence of direct power.

20. Winter Storms/Ice

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

20.1 Ensure that federal, state, and local hazard mitigation plans include preparation for and management of the response to winter storm events and especially long-term disruption of power supplies and transportation infrastructure.

20.2 Provide enhanced funding to ensure that vulnerable residents have shelter, heat, and food for the duration of winter storm or ice events.

20.3 Develop protocols for maintaining transportation systems, including air, roadway, rail, pedestrian, and mass transit during and in the immediate aftermath of winter storm events.

20.4 Design and build utilities to resist damage and loss of service during winter storm events to the extent possible, such as placing lines underground where appropriate.

20.5 Support cross-jurisdictional adaptive planning and facility design using predictive technology to enable facilities to continue functioning even with future increase or variation in winter storm intensity.

HUMAN-CAUSED DISASTERS

21. Airport Hazards and Land-Use Compatibility

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

21.1 Support policies that preserve and protect accident potential zones and clear zones surrounding airports, including military airfields, from incompatible land uses.

21.2 Support policies that increase airport and air travel protection from terroristic threats.

21.3 Expand federal funding for the U.S. Department of Defense's (DoD) Compatible Use Program designed to protect the missions of military airports, while protecting the health, safety, welfare, and economic viability of communities and promote community partnerships and collaboration with DoD for resiliency, joint use agreements, infrastructure, and for shared services.

22. Biological, Chemical, and Radiological Agents

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

22.1 Change the legal framework to place the burden of proof for chemical safety on manufacturers versus requiring the government to prove particular chemicals are not safe, similar to European law (Registration, Evaluation, Authorisation and Restriction of Chemicals [EC No. 1907 / 2006] also referred to as REACH) on chemical safety.

22.2 Review and strengthen the standards associated with the manufacturing, transportation, and storage of biological, chemical, or radiological materials, including advance notification of state and local first-responder agencies along the routes used.

22.3 Develop new, or strengthen existing, federal requirements for the manufacture, storage, and disposal of biological, chemical, or radiological materials, especially when such materials are stored in risk-prone areas.

22.4 Ensure that all levels of government have the appropriate regulatory authority and capacity to require that chemical, biological, or radiological materials are located and handled in ways that protect health and safety.

22.5 Use GIS capabilities to develop a national map of grayfields that identify, wherever possible, the specific biological, chemical, or radiological materials manufactured or stored at each location so that communities can assess the risks posed.

22.6 Protect communities from well-known, established hazards by creating adequate buffer zones around such facilities when considering new residential or institutional development, particularly for disadvantaged or especially vulnerable people such as children or the elderly and others with access or functional needs.

23. Dam and Levee Failures

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

23.1 Develop standards for dam classification based on hazard potential (loss of life and economic damage) and mandate that development occurring downstream from a dam (within an inundation zone) accepts financial responsibility for the elevated safety standards of the dam. The Commonwealth of Virginia's Dam Break Inundation Zone law is an excellent example of equitable distribution of the financial burden of hazard classification compliance.

23.2 Repair or remove obsolete dams depending on a case-by-case life cycle costing analysis of which course of action is most appropriate. The value of dam removal to fish species, especially anadromous species, shall be considered in the benefit cost analysis.

23.3 Require all new levees to be designed to the 500-year floodplain standard plus three or more feet of freeboard. Similarly, require that all major repairs to levee systems improve the protection to the 500-year standard.

23.4 Establish a new national standard that prohibits the use of levees protecting agricultural and undeveloped land from being used to permit new nonagricultural development and prohibit the construction of new levees to create developable land in the floodplain.

23.5 Eliminate policies that restrict the availability of data on dam safety, including federal and privately owned dams, to local planners or those who serve as hazard mitigation planners.

23.6 Regulate areas downstream of high-risk dams and noncertified levees as Special Flood Hazard Areas or develop and use a different term to distinguish the type of flooding/inundation risk faced.

23.7 Ensure that dams holding wastewater, sludge, tailings, coal ash, or other effluent from agriculture or industry are routinely monitored, maintained, and upgraded as necessary to minimize risk to life, property, and environmental resources.

23.8 Require that all new facilities for holding agricultural and industrial waste products be designed and constructed in locations outside of the SFHA to prevent contamination of water sources and supplies should a facility failure occur.

23.9 Provide financial support for periodic inspection, repair, and replacement of dam infrastructure.

23.10 Establish a new dam rating system that assesses the vulnerability to rupture or collapse from a seismic event and the cumulative downstream impacts of such an occurrence.

24. Hazardous Material Incidents

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

24.1 Strengthen federal and university research on the risks and location of human-caused hazards, including chemical and fuel storage, chemical transportation (including pipelines, rail, truck transport, shipping), and chemical disposal (e.g., potential seismic activity associated with deep well injection).

24.2 Expand partnerships with programs such as Transport Canada for safer transportation of hazardous materials through better regulations and new standards including thicker steel and double wall requirements, with additional fitting and shield protection for new tank cars and retrofitting or retiring unsafe tank cars. (See Transport Canada Rule TP1487)

24.3 Evaluate every route used to transport hazardous materials and consider rerouting, restricting, or eliminating such routes that are adjacent to or go through heavily populated areas or cultural resources. While rail freight routes are essentially fixed, they should nonetheless be evaluated to determine if certain segments should be off-limits for hazardous cargoes.

24.4 Require the development of contingency plans for waterway contamination events within each watershed with potable water withdrawals as required by the American Water Infrastructure Act.

24.5 Mitigate both current and future impacts resulting from human-made hazards (such as oil and gas wells, chemical disposal, and chemical storage) by developing regulations that limit development within proximity to such hazards and require indoor and outdoor environmental monitoring during the use and after the hazardous use has been removed.

24.6 Require more frequent inspections of pipelines carrying hazardous liquids and gases and establish a zero-tolerance policy and penalties for safety violations.

24.7 Promote programs that raise awareness of local risks of human-made hazards and action plans.

24.8 Create and fully fund at the federal level additional training and materials for first responders in communities through which hazardous materials are routinely transported.

24.9 Support development of distancing standards to separate hazardous material facilities from sensitive locations such as schools, as well as strategies to support hazard reduction for schools and similar facilities already located near hazardous material facilities.

25. Safe Drinking Water

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

25.1 Fund federal, state, and university research on the risks and location of unsafe drinking water, including when changes in treatment standards and techniques may cause a previously safe system to become unsafe (e.g., Flint, Michigan) and when geologic events or human actions such as hydraulic fracturing and deep well injection could lead to groundwater contamination.

25.2 Promote protections of drinking water sources, including surface water bodies and aquifers.

25.3 Support increased investments in drinking water infrastructure, including maintenance and upgrades of drinking water distribution systems.

25.4 Require routine monitoring of municipal drinking water testing programs by state public health agencies and U.S. Environmental Protection Agency.

26. Terrorism and Civil Disturbance

The American Planning Association and its Chapters and Divisions support the following Policy Outcomes:

26.1 Improve the terrorism threat assessment public warning system.

26.2 Increase coordination between law enforcement and homeland security planners and local hazard mitigation and land-use planners in the planning of future development.

26.3 Increase the use of Crime Prevention Through Environmental Design approaches for developments that may have a high threat risk.

26.4 Expand investments in cybersecurity systems to protect critical infrastructure.

26.5 Coordinate law enforcement, National Guard, and other community security authority plans and responses to minimize the threat to people and property; communicate plans and responses with allied professionals, especially emergency managers.

26.6 Ensure that physically attractive and context-sensitive barriers are used where approach and security barriers are deemed necessary and that they are appropriate to the context of the surrounding built environment in building design and retrofits.

26.7 Support policies that increase protection of infrastructure and public spaces from terrorist threats, gun violence, and cyberterrorism.

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Biological, Chemical, or Radiological Agents

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Related Policy Tools

This Policy Guide is related to other Policy Guides and frameworks adopted by the American Planning Association in recent years, including:

- Climate Change
- Planning for Equity
- Freight
- Sustainability Framework
- Security
- Smart Growth
- Surface Transportation
- Water

Please refer directly to these closely allied policy guides for additional policy reference on those topics: http://planning.org/policy/guides.