



PLANNING FRAMEWORK

Some of the most beautiful developable lands in Colorado also pose significant risk from hazards, such as dense forests with a high risk of wildfire, river corridors subject to frequent flooding, or hillsides at risk of landslide or rockfall. Many people are drawn to build homes and businesses in these attractive places, despite the potential loss of life and property.

The challenge for Colorado’s local governments is to plan for appropriate development to occur while also protecting people and property from the impacts of hazards. Often the simplest way to ensure safer communities is to prohibit building in hazardous areas. However, stopping development altogether in high-risk areas is not always feasible, and planners and local officials must balance the protection of public health and safety with other important goals such as economic development and the provision of affordable workforce housing.

The sections below describe general approaches for mitigating hazards through land use planning and the general legal and regulatory framework for planning for hazards in Colorado.

MITIGATING HAZARDS THROUGH PLANNING

PLANNING IN HAZARDOUS AREAS: A RANGE OF APPROACHES

The following general frameworks describe different approaches for local communities as they balance planning for hazards with other important land use goals.

- Prevent development in hazardous areas.** An obvious solution for making communities safer is to avoid hazardous areas altogether, as discussed in the sidebar on the right. Communities can discourage or restrict development in vulnerable areas such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas. Avoiding hazardous areas can be accomplished through regulations (such as overlay zoning) or through incentives (such as cluster subdivisions). There are also non-regulatory approaches, such as land acquisition.
- Direct future growth to safer areas.** Preventing development in hazardous locations is only part of the equation. Communities can also encourage growth in locations that are less vulnerable to natural hazards. Directing future growth requires that the community

Avoidance

The most effective way to protect development from hazards is simply to prohibit development in known hazard areas.

However, strictly prohibiting development in any area with a potential hazard can be not only logistically challenging, but often politically infeasible. Nevertheless, many of the tools and strategies discussed in this guide are designed to keep development out of harm’s way through avoidance. They include:

- Transfer of development rights
- Cluster subdivision
- Conservation easement
- Land acquisition
- Overlay zoning
- Stream buffers and setbacks
- Subdivision and site design standards
- Post-disaster building moratorium

identify locations deemed suitable for development and redevelopment. This process often forms the core of future land use elements in comprehensive plans. Once safe areas have been identified, communities can back up those policy decisions by directing investment (such as capital improvements and schools) and removing barriers to developing in those areas.

- **Protect existing development in hazardous areas.** Avoiding hazard areas protects future development; however, protecting people, property, and facilities in already-developed areas is just as important. Strengthening existing development can be achieved through many land use and mitigation strategies, such as upgrading development standards to protect vulnerable areas (e.g., stronger floodplain regulations), requiring nonconforming properties to be brought into compliance with updated standards, updating building codes to promote safer development, and in some cases relocating existing structures to less-vulnerable areas.

Each of these approaches provides possible solutions for Colorado communities looking to plan for or protect development from hazard risk. Most likely, a community will embrace a set of complementary approaches based on local circumstances. There are not necessarily bright lines between the approaches. Indeed, there is some overlap, and many of the planning tools profiled in this guide may be used to support more than one objective. For example, a land acquisition strategy could be used to both restrict development in hazard-prone areas and also shift development to safer locations. The approaches should be evaluated for their potential effectiveness, and subsequent regulatory tools tailored to meet local needs.

THE INTERRELATEDNESS OF NATURAL HAZARDS

Natural hazards, like much of nature, are part of an interconnected, complex system. While most hazard events seemingly occur independently, they are often correlated and in some cases may greatly influence the probability, frequency, and magnitude of one another. This can be true even when specific hazard occurrences are separated by long distances or periods in time.

The interrelatedness of natural hazards is particularly evident in Colorado’s semi-arid climate. As described in the *Colorado Resiliency Framework* (2015), three of the most significant hazards of concern in the state are linked together in what has been referred to as the “drought/fire/flood system” (p. 3-7). In this system, the reduced water and moisture availability in a drought increases risks related to wildfire through higher fuel loads (drier conditions, pest infestation, tree mortality, etc.). Severe wildfires can then leave slopes denuded of all vegetation and turn soils into hydrophobic surfaces, preventing rainfall from being absorbed into the ground and in turn rapidly increasing the amount of runoff from heavy rain events. These conditions drastically increase risks related to flash flooding, erosion, and mud/debris flows. As the pattern of these cascading natural hazards suggests, some of Colorado’s most destructive flash flood events can ironically be linked to previous incidents of drought. Many of Colorado’s past disaster events provide clear



Destroyed vegetation after a wildfire.

Source: State Farm Insurance, 2010

evidence of these direct relationships between drought, wildfire, and flood, including a recent series of destructive floods in the burn scar areas surrounding Colorado Springs.

While drought, wildfire, and flood hazards are more discernibly related, they are part of the same natural system with direct or indirect relationships to the risk levels for other hazards including extreme heat, severe winds, lightning, soil hazards, landslides, mud/debris flows, and rockfalls. Further, as described in the next section, the projected long-term effects of climate change are expected to influence the risk levels for most natural hazards in Colorado.

CLIMATE CHANGE

The climate in Colorado is changing, in large part due to increasing levels of greenhouse gases (GHGs) in the atmosphere. The state is significantly warmer today compared to 50 years ago, with the average annual temperature having increased 2.5 degrees Fahrenheit since 1965. Scientists estimate that the state will see an additional 2.5 to 5 degrees of warming by 2050 (*Colorado Climate Plan*, 2015). Already, past warming in Colorado has resulted in multiple hazards including faster and earlier snowmelt, longer and more severe droughts, and more frequent periods of extreme heat. Moving forward, climate change is expected to have significant impacts across multiple sectors of our state's economy.

Climate Change in Colorado – An Interview with Taryn Finnessey

The climate in Colorado is changing, with important implications for local communities. To learn more about the science of climate change in Colorado, the project team interviewed Taryn Finnessey, Climate Change and Risk Management Specialist at the Colorado Water Conservation Board (CWCB).

Q: What is the climate change outlook for Colorado?

Temperatures in Colorado have risen, and we are anticipating an additional 2.5 degrees of warming by mid-century. Warming is really the driver that affects water availability, soil moisture, and evapotranspiration. All of those play a role in fire hazard, drought, and ecosystem and watershed health. Temperature has an impact on floods, both post-fire and post-drought. There are public health implications as a result of increased temperature and impacts on water quality and air quality.

Precipitation is a bit harder to pin down. Some models show precipitation increasing, some show it decreasing. Should we see a decrease in precipitation, it will further compound many of these issues. Even if precipitation stays the same, we will see a decrease in water availability because it will take incrementally more precipitation to overcome that warming signal.

Q: What other impacts should we expect to see from the changing climate?

One of the things we will see is an increase in water temperatures, which is obviously a concern for our cold-water fish species. We are also seeing a shift in earlier spring runoff by 1-3 weeks, separately from dust-on-snow events. These earlier peak runoffs result in lower late summer flows. In some areas, this means rivers are not flowing, which has implications for riparian habitats and fisheries. There is also concern about the spread of non-native species and disease across all ecosystems. These non-native species may be more competitive in regions that become too warm or that are changing too rapidly for native species to adapt.

Taryn Finnessey is a staff member at the Colorado Water Conservation Board and was formerly a water policy analyst for Western Resource Advocates. [Climate Change in Colorado](#), released by the CWCB in August of 2014, is the scientific foundation for the [Colorado Climate Plan](#). This interview was conducted in October 2015 by Andrew Rumbach (University of Colorado Denver). The interview has been condensed and edited.

In 2013, the Colorado General Assembly passed House Bill 13-1293, which declared that climate change “presents serious, diverse, and ongoing issues for the state’s people, economy, and environment.” The State has since released several plans and reports focused on reducing the impacts of climate change, whether through mitigation (actions to reduce greenhouse gas emissions) or adaptation (actions to cope with change climate conditions). *The Colorado Climate Change Vulnerability Study* (2015), commissioned by the Colorado Energy Office, is an overview of key vulnerabilities of state resources to climate change. The *Colorado Climate Plan* (2015) is intended to promote state policy recommendations and actions that will help the state to mitigate greenhouse gas emissions and adapt to future climate change impacts. The *Colorado Climate Plan* follows the publication of the *Colorado Climate Action Plan* (2007), which focused largely on greenhouse gas mitigation.

CONSIDERING COMMUNITY CONTEXT

The tools and strategies included in this guide come with an important caveat – one size does not fit all. A tool that is effective for one community may be less effective for another based on several factors discussed in this section. Understanding local context is essential to building support for land use decisions and achieving appropriate mitigation strategies. It is also important to recognize that the tools and strategies included in this guide are examples and best practices, and in many cases can be further tailored to fit within the local context. For example, a simpler Transfer of Development Rights (TDR) program can be developed for smaller communities with fewer staff to administer the program, rather than simply assuming that the tool will not work for that particular community.

SIZE AND GEOGRAPHIC LOCATION

Colorado communities range in population size, from large cities like Denver and Grand Junction, to small towns such as Buena Vista and Brush. Typically, larger communities have more local government staff and larger budgets. They may have more resources available to help plan for and manage the impacts from hazards. However, many small towns in Colorado are faced with the same hazard-related challenges as larger cities.

For example, the City of Boulder, with a population of 97,385 (*Boulder city, 2010*), and the City of Glenwood Springs, with a population of 9,614 (*Glenwood Springs city, 2010*), are both nestled in the foothills. Both cities have significant development pressure in the Wildland-Urban Interface (WUI), and each has experienced devastating wildfires in the past decade. While the geographic extent of the Boulder restrictions will be broader given the community’s larger size, the two communities may implement similar programs and land use tools for wildfire mitigation, such as adopting restrictions on hillside development.

Another important factor to consider is geographic location. Colorado is divided into several climates and ecologies, each with a unique set of challenges



Boulder is a much larger community than Glenwood Springs, yet both have similar planning issues related to significant development pressure in the WUI.

Source: Nelson Sirlin, 2016

related to natural hazards. For example, tornados and extreme drought conditions on the Eastern Plains are often not present or are less severe in higher alpine communities. Geographic location can also influence factors such as political palatability of a particular strategy, cost to implement mitigation actions, and effectiveness of a particular tool based on local conditions.

TECHNICAL, ADMINISTRATIVE, AND FINANCIAL CAPACITY

A program or tool is only effective if it is consistently administered and enforced. For example, landscaping maintenance standards are an appropriate mechanism for reducing fuel load in wildfire-prone areas. However, without dedicated staff or other resources to enforce those standards, compliance will be limited. It is important for any community considering a new planning tool or strategy to evaluate:

- **Technical capability.** Does the community have the technical understanding or immediate access to training necessary to adequately administer the program or tool?
- **Administrative resources.** Would administration of the strategy or tool require additional employees or contractors?
- **Financial capacity.** What are the costs to administer and maintain the proposed strategy or tool? What resources are available (both internal and external) to help implement the tool?

COMMUNITY GOALS AND POLITICAL WILL

In addition to quantifiable factors such as human and financial resources, communities must also evaluate whether or not a proposed tool or strategy is aligned with the community's values and political environment. A good comprehensive plan will clearly identify the community's goals and vision for the future. That makes it easier to build support for initiatives that are in tune with such stated values. However, in the absence of clear direction, communities (and often land use planners) have to test the waters through public forums, interaction with elected and appointed officials, and stakeholder interviews before estimating the feasibility of adopting a new tool or strategy in the community.

It is important to understand the local nuances to build a more effective case for land use planning and hazard mitigation. For example, if a community is continually pushing tree preservation as a top priority, then promoting defensible space standards (which typically involve thinning fuels) would require proactive discussion on how to both preserve the forest while also protecting people and structures from wildfire risk.

Another consideration related to the political environment is the general comfort level for policy versus regulation and incentive versus regulation. For example, if the current political climate is actively promoting incentives for development and is adverse to additional regulatory tools, then planners can explore a different set of strategies for mitigating hazards (e.g., density bonuses that



A community stakeholder meeting.

Source: Clarion Associates

encourage conservation in lieu of an overlay zone that prohibits development).

In sum, the size, location, resources, and policy goals of a community all influence the degree and extent to which it should embrace the particular planning tools described in this guide. Each tool should be tailored according to the local context, particularly in terms of resources available for long-term maintenance, enforceability, and administration. Answering these questions is not always clear-cut. Thoughtful consideration should be given to how a new program or tool might also impact other current policies and regulations, how other departments or agencies may be impacted, and whether additional funding mechanisms should be pursued.

LAND USE PLANNING AND REGULATION IN COLORADO

Defensible land use regulations must be supported by appropriate enabling authority. This section discusses the general legal framework for land use planning in Colorado, including regulating for hazards. The section also describes the local framework for mitigation planning and identifies state policies and programs that help bolster the state’s commitment to hazard mitigation.

ENABLING LEGISLATION AND AUTHORITY

Colorado is a “local control” state when it comes to land use planning authority (*Local Government*, 2012). This means that most land use decisions such as adoption of zoning and building codes are driven by local governments, not by the state. The State of Colorado designates land use authority to local governments through several key pieces of enabling legislation, including:

- **Local Government Land Use Control Enabling Act** (C.R.S. § 29-20-101, et. seq.). This act grants counties and municipalities the authority to plan for and regulate the use of land within their jurisdiction, specifically including the regulation of development and activities in hazardous areas.
- **Home Rule Powers** (Articles XX and XIV of the Colorado Constitution). More than one-third of Colorado municipalities are classified as “home rule.” This means that those local governments are able to draw upon any authority delegated by the General Assembly, and also any additional authority from their locally-adopted home rule charter. There are some limitations, including the ability to supersede state statutes only when the matter is of local concern. Municipalities and counties that are not classified as home rule must abide by the authority granted through state statutes.
- **Master Plans** (C.R.S. § 30-28-106 and § 31-23-206). Colorado counties and municipalities are authorized to prepare master plans (commonly known as “comprehensive plans”) to plan for the physical development of their community. Unlike many other states, there are few mandates for the content or format of comprehensive plans. As discussed later in this guide, Colorado communities can address hazard mitigation in the comprehensive plan through various mechanisms.
- **Zoning** (C.R.S. § 30-28-111 and § 31-23-301). The state authorizes Colorado communities to adopt local zoning regulations to promote the health, safety, morals, and general welfare of residents. Zoning is a common tool used for protecting current and future development from hazard areas. Zoning is related to and may be somewhat restricted by other state and federal laws, such as in the areas of telecommunications, signs, religious institutions, and treatment of protected classes.

- **Areas and Activities of State Interest** (C.R.S. § 24-65.1-101). Colorado communities are permitted to identify, designate, and regulate areas and activities with statewide impacts such as natural hazard areas, site selection of airports, mass transit facilities, and development of new communities. Commonly known as “1041 regulations” (after the enabling act, HB 1041), these regulations allow local governments to retain control and develop permitting procedures and standards for development.

LOCAL HAZARD MITIGATION PLANS

Colorado communities can integrate land use planning and mitigation by using the information contained in Local Hazard Mitigation Plans, adopted locally and approved by FEMA. Local Hazard Mitigation Plans consolidate hazard-related information prepared by a municipality, county, or region, including the assessment of potential hazards and risk, identification of vulnerable populations, and development of mitigation strategies. Although the development of Local Hazard Mitigation Plans is commonly led by emergency management and public safety personnel, planners are becoming increasingly involved in the process. These plans, which make the projects identified therein eligible for a variety of grant funds related to hazard mitigation, are discussed in further detail later in this guide in the planning tool profile for the *Local Hazard Mitigation Plan*.

COMPREHENSIVE PLANNING

Communities can lay the foundation for hazard mitigation strategies and implementation tools through their comprehensive plans. Integrating planning policies with other hazard mitigation tools is discussed in greater detail in a later section on *Addressing Hazards in Plans and Policies*.

Resilience

Colorado communities are constantly striving to improve quality of life, economic opportunity, high quality education, and access to resources for their residents. However, communities may be vulnerable to shocks (large, disruptive events that cause significant immediate damage, injuries and deaths, or result in sudden changes in the community) and stresses (chronic conditions that magnify vulnerability and make it harder to recover from shocks) that can greatly impede their goals.

The majority of hazards described in this guide cause major shocks to a community. Reducing the risk to such events greatly increases a community's resilience. Long-term stresses such as drought – as well as economic and social stresses such as high unemployment, housing shortages, or polluted waterways – should also be addressed in order to make the community better able to withstand unknown future conditions. All of these community risks should be assessed and strategies developed to improve the resilience of a community to these potential risks. Land use policies and regulations can play a valuable role in reducing and avoiding risk.

To reduce these risks, communities should assess what makes them more or less resilient to shocks and stresses, develop partnerships and engage community networks, develop a vision for resilience, and then implement this vision in plans, policies, and projects.

In May 2015, Governor Hickenlooper adopted the Colorado Resiliency Framework, documenting Colorado's commitment to and investment in a resilient future. Resilience is defined in the Framework as "the ability of communities to rebound, positively adapt to, or thrive amidst changing conditions or challenges – including disasters and climate change – and maintain quality of life, healthy growth, durable systems, and conservation of resources for present and future generations."

The framework identifies Colorado's most pressing challenges for risk and vulnerability and establishes clear goals and strategies to improve resiliency in several sectors including community, economy, health and society, housing, infrastructure, and watersheds and natural resources. The framework includes recommendations and implementation actions that the State and local governments can take to make Colorado more resilient to shocks and stresses.

Learn more about the Colorado Resiliency Framework (2015) on the "Colorado United" website: sites.google.com/a/state.co.us/coloradounited.

