

# The Lower Boise Watershed Implementation Plan

**HazCIRC**



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## Executive Summary

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This report details various strategies and tools to implement recommended mitigation actions for the Lower Boise Watershed. Although the watershed is located within six counties, this risk report focuses on the areas of Ada County and Canyon County within the watershed boundaries. This implementation plan should be used in conjunction with the Lower Boise Watershed Risk Report. Where the risk report details the hazards and potential losses from earthquakes, floods, landslides, and wildfires, the implementation plan details methods and programs that communities and agencies within the watershed can employ to successfully complete mitigation actions and projects. This work was completed by the Hazards and Climate Impacts Research Center (HazCIRC) and funded by the Federal Emergency Management Agency (FEMA) and the Risk Mapping, Assessment, and Planning (Risk MAP) program.

This report discusses the following:

- Hazard mitigation plans and planning processes
- The State of Idaho growth management strategies and applications to hazards
- Best practices for incorporating hazard mitigation into comprehensive planning
- Current growth management strategies that incorporate hazard mitigation in Ada County and Canyon County
- Recommended strategies and tools for successful mitigation implementation

Recommended strategies and tools range from land use planning to building design, additional mapping and data management, public outreach, to climate impacts assessments and comprehensive socioeconomic vulnerability assessments.

The ultimate goal of this implementation plan is to provide avenues for communities to integrate hazard mitigation into growth management planning to enhance resilience to hazards. At the watershed level, this implementation plan provides a foundation on which to build a regional cooperative network vital to comprehensive mitigation planning, lowered community vulnerability, and reduced mortality and property losses from current and future risks.

# I. Introduction

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Natural hazards can cause damage to property and loss of life. Mitigation action can reduce or eliminate these losses. Mitigation is defined as sustained action to reduce or eliminate long-term risk to life and property from hazards. The primary process through which mitigation is most often achieved for communities is the hazard mitigation planning process. The end deliverable of this process is a Hazard Mitigation Plan (HMP).

## Hazard Mitigation Plans

The purpose of the Stafford Act, as amended by the Disaster Mitigation Act of 2000 (DMA), is “to reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters.” Under provisions of the DMA, HMPs are required for State, tribal, and local governments to receive FEMA hazard mitigation funds. Developing HMPs also enable these communities to accomplish the following:

- Increase education and awareness of threats, hazards, and vulnerabilities;
- Build partnerships for risk reduction;
- Identify long-term risk reduction strategies;
- Align risk reduction with other State, tribal, or community objectives;
- Identify implementation approaches that focus resources on the greatest risks and vulnerabilities; and
- Communicate priorities to potential sources of funding.

FEMA requires the following elements for HMP approval:

**Planning Process.** The hazard mitigation planning process must include an open public involvement process. This process constitutes a more comprehensive approach to reducing the effects of both technological and natural hazards. During the planning process, there must be opportunity for the public to comment on the plan during the drafting stage and prior to plan approval. Additionally, neighboring communities, and local, State, and Federal agencies must have the opportunity to be a part of the planning process. The planning processes itself must also be documented. Existing plans, studies, reports, and technical information must be reviewed, and if applicable, incorporated into the plan. Finally, the plan must provide a narrative of the maintenance process over the five-year plan lifecycle that includes public participation.

**Hazard Identification and Risk Assessment.** The risk assessment is the factual basis of the HMP. Risk assessments must include a description of the type, location, extent, and magnitudes of all hazards that affect the county and its communities. The plan must also include information on previous hazard events, as well as the probability of future hazard events. The HMP risk assessment must also include a vulnerability analysis that includes the following:

- The types and numbers of existing and future buildings, infrastructure, and critical facilities exposed to each hazard;
- An estimate of potential dollar losses from distinct scenarios; and
- A general description of land uses and development located in the identified hazard areas.

**Mitigation Strategy.** HMPs must include a mitigation strategy that provides the community's blueprint for reducing losses to hazard events identified in the risk assessment. The strategy is based on existing authorities, policies, programs, and resources within a county and is applicable to its incorporated communities, as well as the county's ability to expand on and approve these existing tools. The mitigation strategy must provide goals to reduce or avoid vulnerabilities to hazards, with identifiable mitigation actions. These mitigation actions must include a plan for prioritizing, implementing, and administering each item.

**Plan Review, Evaluation, and Implementation.** HMPs must be reviewed by local communities to reflect changes in development, progress in local mitigation efforts, and changes in priorities. HMPs must be resubmitted for approval within five years to maintain eligibility for mitigation funding through FEMA's grant programs.

**Plan Adoption.** HMPs must document the formal adoption of the plan by the governing body of the community that is requesting plan approval. If the plan is a multi-jurisdictional plan (such as a county and its incorporated areas), each jurisdiction that is requesting plan approval must also formally adopt the plan and provide documentation of adoption.

## Risk MAP

Risk MAP is a FEMA program that provides communities with flood information and tools they can use to enhance their mitigation plans and to better prepare their citizens. The program's vision states "Risk MAP will deliver quality data that increases public awareness and leads to action that reduces risk to life and property." This process places a heavy emphasis on community engagement and partnerships while aiming to reduce hazard vulnerability, enhance resilience, and encourage sustainable growth within participating communities.

The Risk MAP Process consists of the following six major phases:

**Project Planning.** The first phase of the Risk MAP process consists of selecting the project area and implementing the Discovery Process. Selection of a project area is determined by reviewing a watershed and its current flood risk, available data, increases in development, the population affected by hazards, and other related factors. The Discovery Process then commences when FEMA, State, and local officials meet and review the area's flood risk to determine updated mapping needs and the areas to be mapped.

**Mapping and Data.** Once a flood risk mapping project is initiated, the data, maps, and flood risk products are prepared. These products may include regulatory Flood Insurance Rate Maps (FIRMs) or non-regulatory flood risk products that can be used for planning purposes. Community officials then meet to discuss the preliminary FIRM and Flood Insurance Study (FIS) report and flood risk products, where Areas of Mitigation Interest (AOMI) and actions can be identified, and how to communicate these changes to the public. This communication is often delivered through a Resiliency Meeting, which is held with the general public to discuss the community's flood risk and how to reduce this flood risk by planning for the future.

**Preliminary FIRM Issuance.** During this phase of the Risk MAP process, preliminary versions of the FIRM and FIS report are delivered to community officials and posted for public review and



comment. After the public notification process, communities can appeal the FIRM if they believe it to be scientifically or technically incorrect.

**Risk Assessment.** Local officials are provided with flood risk products, including risk assessments completed using FEMA's Hazus-MH software. These products help identify flood risk and their impacts on the community.

**Effective FIRM and FIS Report Issuance.** After all appeals from communities participating in the Risk MAP process are resolved, a Letter of Final Determination (LFD) is sent to community officials by FEMA. The LFD is sent six months before the new FIRMs and FIS report become effective. Local communities must adopt or amend their floodplain ordinances during this six-month period.

**Planning for Mitigation Action.** Risk MAP's flood risk products provide potential mitigation actions and public outreach methods that help communicate this risk and help guide growth management planning in the community.

## Hazard Mitigation Integration into Growth Management Planning

Integrating hazard mitigation into growth management planning is beneficial for many reasons. Local governments can enhance the development and implementation of strategies for reducing risks and vulnerabilities to hazard events if the two are integrated. Integration also helps avoid conflicting planning and development goals and hazard mitigation projects. With hazard mitigation in mind, local planning efforts can proactively reduce losses and impacts from future hazard events, as growth and development can be directed away from hazardous areas, or these efforts can occur with hazard retrofits and mitigation in mind. Integrating hazard mitigation into growth management planning can also increase the implementation potential of mitigation actions detailed in the HMP, as the HMP as a standalone plan has no regulatory power. Ultimately, successful incorporation of hazard mitigation into growth management planning is vital to enhancing community resilience by reducing hazard risk and vulnerability.

## II. Lower Boise Watershed Risk MAP Update

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The Lower Boise Watershed falls within the boundaries of six counties. The counties include Ada County, Boise County, Canyon County, Gem County, Elmore County, and Payette County. However, Ada County and Canyon County were the only two participating communities in the Lower Boise Risk MAP update. Through various Discovery Report meetings and data collection, it was determined that a Physical Map Revision for Willow Creek, Mill Slough, Nine Mile Creek, and the Lower and Upper Boise River would be completed.

The communities of Ada County and Canyon County also discussed desired mitigation projects to be included in each county's next HMP update. These projects include installing culverts at North Lake Lowell, Five Mile Creek, and Ten Mile Creek, with the additional request from the City of Eagle to model split flow scenarios at the head of Eagle Island for an advisory and planning tool.

Deliverables from the Lower Boise Watershed Risk MAP Discovery Process and Physical Map Revision included engineered depth grids for the 10, 25, 50, 100, and 500-year flood events (10 percent, 4

percent, 2 percent, 1 percent, and 0.2 percent probability) for Willow Creek, Mill Slough, Nine Mile Creek, the Lower and Upper Boise River, and four split flow scenarios for Eagle Island. These depth grids were used in FEMA's Hazus-MH model to estimate flood losses in Ada County and Canyon County. These flood loss results are presented in the Lower Boise Watershed Risk Report along with earthquake losses, landslide risk, and wildfire risk. The Risk Report also presents "Areas of Mitigation Interest" and "Recommended Mitigation Actions" that can help increase community resiliency and reduce risk and vulnerability to hazard events.

## Risk Report Summary

The Lower Boise Watershed Risk Report analyzed the exposure and socioeconomic vulnerability of Ada County and Canyon County and their incorporated areas to earthquake, flood, landslide, and wildfire. Socioeconomic vulnerability was assessed using the Spatially Explicit Resilience-Vulnerability (SERV) model. Loss estimations employed the FEMA's Hazus-MH software and were completed for a number of scenarios for earthquake and flood. The risk assessment was used to develop AOMI, which are those areas within the communities that are notably exposed or vulnerable. From these areas, mitigation strategies to reduce exposure, vulnerability, and loss were proposed to provide a foundation that local community leaders and stakeholders can build upon.

Flood loss estimates for Ada County were between 58 damaged structures and more than \$330 thousand in losses from a 10-year flood event, to more than 7,700 structures and \$683 million from a 500-year flood event. Garden City and the Cities of Boise and Eagle were notable for the extent of potential damages from floods. Loss estimates for Canyon County were not as extensive, with an estimate of four structures with damages in the \$60 thousand range from a 10-year flood and 458 structures with damages in the \$2.3 million range from a 500-year flood.

Loss estimates for three earthquake scenarios developed by the United States Geologic Survey (USGS) showed the highest losses from a 7.0 magnitude earthquake at Squaw Creek. Structural damage in Ada County was estimated at \$1.3 million, while Canyon County was estimated to experience \$1.9 million in structural damage. The two other scenarios considered were a 6.0 magnitude earthquake at Squaw Creek and a 7.3 magnitude earthquake at Borah Peak.

The landslide analysis identified 13 structures in the City of Boise and seven in the unincorporated areas with proximity to landslide susceptible slopes. Landslide risk in Canyon County was much lower at three structures with proximity to susceptible slopes. This pattern held for the remaining hazards, with Ada County exhibiting greater exposure to higher risks. More than 2,000 structures were exposed to high wildfire risk. In contrast, 129 structures were exposed to high wildfire risk in Canyon County.

The risk report and its data are useable by all local, State, and Federal agencies working within the Lower Boise Watershed. The data and results of the risk assessment are in the Lower Boise Watershed Risk Database and can be used to update local plans, communicate risk and target areas of concern, inform policy and standards relating to land use planning and hazards, identify and prioritize mitigation actions, and help build sustainable communities in the State of Idaho.

### III. Growth Management in Idaho through the Local Land Use Planning Act

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Idaho adopted its Local Land Use Planning Act (LLUPA) in 1975 as concerns grew about the rapid growth of the State's population and expansion of urban areas into the rural countryside. As of 2010, Idaho was the 12th fastest growing State in the United States, further justifying a need for growth management policy. This act requires that every city and county must adopt a comprehensive plan and implement land use planning through a zoning ordinance, subdivision ordinances, and area of city impact ordinances. The Idaho LLUPA also provides authority to adopt certain laws and policies at the discretion of the governing board.

#### Comprehensive Plans

A comprehensive plan is a long-range statement of policy that guides growth and development of a city or county. The document reflects social and cultural values of the time through multiple components or community characteristics. The comprehensive plan represents the community's consensus about where development should occur and how the overall quality of life can be improved. The LLUPA requires cities and counties to develop a comprehensive planning process designed to prepare, implement, review, and update the long-range document. The comprehensive plan also considers previous and existing conditions within the community or county, the desired goals and objectives or future conditions, and compatibility of land uses. There are 17 required components in a comprehensive plan, which should be supplemented with maps, charts, and reports as they apply to land use regulations and actions unless the plan justifies the exclusion of a component. Each component may act as a stand-alone chapter or it may be integrated into other components of a similar nature.

The 17 required components are as follows:

**Property Rights.** An analysis of provisions which may be necessary to ensure that land use policies, restrictions, conditions, and fees do not violate private property rights, adversely impact property values, or create unnecessary technical limitations on the use of property as prescribed under the declarations of purpose in chapter 80, title 67, Idaho Code.

**Population.** A population analysis of past, present, and future trends in population including such characteristics as total population, age, sex, and income.

**School Facilities and Transportation.** An analysis of public school capacity and transportation considerations associated with future development.

**Economic Development.** An analysis of the economic base of the area including employment, industries, economies, jobs, and income levels.

**Land Use.** An analysis of natural land types, existing land covers and uses, and the intrinsic suitability of lands for uses such as agriculture, forestry, mineral exploration and extraction, preservation, recreation, housing, commerce, industry, and public facilities. A map shall be prepared indicating suitable projected land uses for the jurisdiction.

**Natural Resource.** An analysis of the uses of rivers and other waters, forests, range, soils, harbors, fisheries, wildlife, minerals, thermal waters, beaches, watersheds, and shorelines.

**Hazardous Areas.** An analysis of known hazards that may result from susceptibility to surface ruptures from faulting, ground shaking, ground failure, landslides or mudslides; avalanche hazards resulting from development in the known or probable path of snowslides and avalanches; and floodplain hazards.

**Public Services, Facilities, and Utilities.** An analysis showing general plans for sewage, drainage, power plant sites, utility transmission corridors, water supply, fire stations and firefighting equipment, health and welfare facilities, libraries, solid waste disposal sites, schools, public safety facilities, and related services. The plan may also show locations of civic centers and public buildings.

**Transportation.** An analysis, prepared in coordination with the local jurisdiction(s) having authority over the public highways and streets, showing the general locations and widths of a system of major traffic thoroughfares and other traffic ways, and of streets and the recommended treatment thereof. This component may also make recommendations on building line setbacks, control of access, street naming and numbering, and a proposed system of public or other transit lines and related facilities including rights-of-way, terminals, future corridors, viaducts and grade separations. The component may also include port, harbor, and other related transportation facilities.

**Recreation.** An analysis showing a system of recreation areas, including parks, parkways, trailways, river bank greenbelts, beaches, playgrounds, and other recreation areas and programs.

**Special Areas or Sites.** An analysis of areas, sites, or structures of historical, archeological, architectural, ecological, wildlife, or scenic significance.

**Housing.** An analysis of housing conditions and needs; plans for improvement of housing standards; and plans for the provision of safe, sanitary, and adequate housing, including the provision for low-cost conventional housing, the siting of manufactured housing and mobile homes in subdivisions and parks and on individual lots that are sufficient to maintain a competitive market for each of those housing types and to address the needs of the community.

**Community Design.** An analysis of needs for governing landscaping, building design, tree planting, signs, and suggested patterns for community design, development, and beautification.

**Agriculture.** An analysis of the agricultural base of the area including agricultural lands, farming activities, as well as farming-related businesses and the role of agriculture and agricultural uses in the community.

**Implementation.** An analysis to determine actions, programs, budgets, ordinances, or other methods including scheduling of public expenditures to provide for the timely execution of the various components of the plan.

**National Interest Electric Transmission Corridors.** After notification by the public utilities commission concerning the likelihood of a federally designated national interest electric

transmission corridor, prepare an analysis showing the existing location and possible routing of high voltage transmission lines, including national interest electric transmission corridors based on the United States Department of Energy's most recent national electric transmission congestion study pursuant to sections 368 and 1221 of the energy policy act of 2005. "High-voltage transmission lines" means lines with a capacity of one hundred fifteen thousand (115,000) volts or more supported by structures of forty (40) feet or more in height.

**Public Airport Facilities.** An analysis prepared with assistance from the Idaho Transportation Department Division of Aeronautics, if requested by the planning and zoning commission, and the manager or person in charge of the local public airport identifying information including, but not limited to, facility locations, the scope and type of airport operations, existing and future planned airport development and infrastructure needs, and the economic impact to the community.

## Land Use Planning

The land use element is the most important component within the comprehensive plan. Local officials often rely on this component when making land use decisions within the city or county. However, the comprehensive plan has no regulatory power, and land use planning is implemented through mandated ordinances. These include the zoning ordinances, subdivision ordinances, and area of city impact ordinances defined below:

**Zoning Ordinance.** Zoning is the means through which cities and counties implement land use control by dividing the community into districts to regulate the use of private property and the spacing, size, and placement of buildings. The original purpose of zoning was to protect residential areas from incompatible commercial and industrial uses. The contemporary purpose of planning expanded to include the protection and conservation of natural, historical, and cultural resources, as well as to regulate development in hazardous areas.

The zoning authority in Idaho is inherent within the police power of States to impose restrictions on private rights in order to protect the health, safety, morals, and general welfare of the public. The Idaho LLUPA delegates this zoning authority to the cities and counties.

The Idaho LLUPA requires all cities and counties in the State to adopt a zoning ordinance that consists of a zoning map and the text of the ordinance, as well as provisions for variance applications and the timely processing of permits. This ordinance must be in accordance with the comprehensive plan, yet if the zoning ordinance and the comprehensive plan conflict, the zoning ordinance must always be in line with the current conditions of the city or county.

The zoning map visually displays how the city or county has divided the community into districts. These districts often follow property lines and the centerline of streets. The zoning ordinance text defines each delineated zoning district, which generally includes a zone for residential, commercial, industrial, and agriculture. Within each of these districts, specific land uses are permitted, conditionally permitted, or prohibited. In the case of a permitted land use, the only requirement is a development permit from the local governing body. If a land use is conditionally permitted, the discretion of the planning and zoning commission or governing

board is needed to determine if the use is compatible with the surrounding neighborhood and uses. If a use is prohibited, then it is prohibited within the district.

In the State of Idaho, zoning ordinances often include “overlay zones” that are generally created to regulate development in hazardous areas and to protect and conserve natural, historical, and cultural resources. A “flood hazard overlay zone” is one of the most common overlay zones adopted by cities and counties in the State. These zones may reduce the number of uses permitted in the area, establish additional zoning standards, or establish more restrictive zoning standards than the “underlying zone.” Development must adhere to the standards in each zone if located in an area where more than one overlay zone is present.

**Subdivision Ordinance.** The purpose of a subdivision regulation is not only to provide a simple method of conveying land by a developer, but also to address factors associated with the orderly development of land and provision of services and infrastructure, such as sidewalks and open space. Idaho Law defines a “subdivision” as a “tract of land divided into five or more lots, parcels, or sites for the purpose of sale or building development, whether immediate or future.” However, local governments may adopt more restrictive definitions. Cities and counties must include the following various provisions within their subdivision ordinances:

- A definition of subdivision and procedures for the review and approval of applications;
- Standards and requirements for dedication of streets, sidewalks, water, sewer, and stormwater facilities;
- Requirements for mitigation of the impact of development on public facilities;
- The timeframe during which preliminary plat approval is effective;
- Requirements for public notice and hearing;
- Security requirements for construction of public improvements; and
- Reasonable time limits for processing of applications.

A common practice in Idaho is the adoption of subdivision regulations for hazardous areas. These regulations may include the completion of a hazardous area analysis during the application process, often submitted with the preliminary plat, or compliance with other adopted hazardous area ordinances. If it is determined that a subdivision is located within a hazardous area or has the presence of hazardous conditions, an additional environmental impact statement may be necessary.

**Area of City Impact Ordinance.** Annexation is the process of expanding the legal boundaries of a city to include previously unincorporated areas. Idaho Law grants the established municipal annexation authority and the necessary procedures that cities must follow when undertaking the annexation process. Municipal annexation is important for various reasons, including the following:

- Economic development;
- Planned expansion of infrastructure;
- Clear jurisdictional boundaries;
- Fair share of taxation; and
- Unity of the urban community.

In Idaho, land that is to be annexed must be adjacent or contiguous to the city and the city must have an area of city impact ordinance in place. The area of city impact is defined as the “region surrounding a city that will eventually develop and become part of the municipality” and serves to define the area for city growth and to establish the land use regulations governing the urban fringe area. When considering the extent of the area of city impact, the committee must consider the local trade areas, geographic factors, and areas that can reasonably be expected to be annexed by the city in the future. An area of city impact agreement is negotiated between city and county officials and results in two specific ordinances, including an ordinance establishing the area of city impact map and an ordinance that sets forth whether the city or county’s comprehensive plan and zoning and subdivision regulations will apply in the area of city of impact. If agreed upon, this ordinance may use a combination of both county and city regulations.

## Discretionary Planning Laws and Policies

The Idaho LLUPA grants cities and counties the authority to adopt certain laws and policies at the discretion of the local governing board. These include, but are not limited to, establishing the following:

**Future Acquisition Map.** A future acquisition map may be adopted by cities and counties that designate land proposed for acquisition by a public agency for a maximum 20-year period. The land designated on the map may include various land uses including the following:

- Streets, roads, other public ways, or transportation facilities proposed for construction or alteration;
- Proposed schools, airports, or other public buildings;
- Proposed parks or other open spaces; and
- Lands for other public purposes.

When a city or county receives a permit for a development on land that is designated on the local future acquisitions map, the planning and zoning commission or governing board may notify the public agency wishing to acquire the land so that the agency may negotiate with the landowner to obtain an option to purchase the land or to condemn the land.

**Transfer of Development Rights.** Transfer of Development Rights (TDR) programs separate the development potential of a parcel from the land itself and creates a market where the development may then be sold. This program is generally implemented to protect sensitive lands and to transfer development to areas more suitable for development. These areas are called sending and receiving areas, respectively. According to the Idaho LLUPA, any city or county governing body may adopt an ordinance that creates development rights and establishes procedures authorizing landowners to voluntarily transfer said development rights subject to certain conditions. These conditions include the following:

- Fulfilling the goals of the city or county to preserve open space;
- Protecting wildlife habitat and critical areas;
- Enhancing and maintaining the rural character of lands with contiguity to agricultural lands suitable for long-range farming and ranching operations; and

- Avoiding the creation of aviation hazards.

Note that the landowner must voluntarily accept the development rights and any land use restrictions conditional to such acceptance.

**Development Agreements.** A development agreement is a written commitment made by the property owner as a condition of rezoning concerning the use or development of a specific property. According to Idaho Law, this agreement, unless modified or terminated by the governing board, is a commitment for the current and subsequent owner of the property. Drafting a development agreement is a very time- and staff-intensive method to get specific performance restrictions for individual property owners. These agreements are also often difficult to implement in smaller cities and counties.

**Planned Unit Development Regulations.** A Planned Unit Development (PUD) is defined in a local ordinance as “an area of land in which a variety of residential, commercial, industrial, and other land uses are provided for under single ownership or control.” According to the Idaho LLUPA, a PUD ordinance may include requirements for the following:

- Minimum area;
- Permitted uses;
- Ownership;
- Common open space;
- Utilities;
- Density;
- Arrangements of land uses on a site; and
- Permit processing.

As with subdivision regulations, there may be additional regulations for PUD applications regarding hazardous areas.

**Building Standards.** Idaho Law provides the authority for cities and counties to adopt standards as part of the zoning ordinance or as stand-alone ordinances. Standards may address items including, but not limited to the following:

- Building design;
- Greenbelts, planting strips, parks, and open space;
- Trees;
- Roadways;
- Pedestrian walkways;
- Lighting;
- Sewer systems;
- Storm drainage systems;
- Street numbers; and
- Schools, hospitals, and other public and private development.



A common method for implementing building standards is through the adoption of International Building Codes, which often include specific construction standards for hazardous areas, such as earthquakes.

## IV. Examples of Regional Best Practices for Hazard Mitigation and Comprehensive Plan Integration

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Including hazard mitigation policies within a community's comprehensive plan is a vital step towards reducing hazard risk and vulnerability. These policies can then be implemented through regulatory growth management strategies. This section provides "best practice" examples of integrating hazard mitigation policies into comprehensive plans from communities in Idaho and the nearby States of Alaska, Oregon, and Washington.

### City of Driggs, Idaho

The City of Driggs is in the Teton Valley between the Teton and Big Hole Mountains in eastern Idaho. The city is at risk to hazards such as drought, winter storms, flooding, earthquakes, and wildfire. The city includes not only the Idaho LLUPA-mandated hazardous area chapter in its comprehensive plan, but also includes a recommended future land use map that designates the floodplain as preferred open space and wetlands. The hazardous area chapter of the comprehensive plan includes a goal, objective, and detailed actions aiming to reduce hazard vulnerability. The overall goal for the hazardous area chapter in the City of Driggs Comprehensive Plan is to "minimize risk or damage or injury from known hazards." To achieve this goal, the city proposed detailed actions that can be implemented through the State's growth management strategies. These actions (which are often one of the weakest components of hazardous area chapters around the State) include the following:

- Developing a floodplain ordinance;
- Requiring PUDs to place all building envelopes outside of the 100-year floodplain and providing incentives for this option;
- Continuing to work with county, State, and Federal agencies, and other organizations on a restoration plan for Teton Creek;
- Continuing to adopt the most recent International Building Code;
- Enforcing the business license requirements for inspections of potential hazards prior to allowing occupancy for new uses;
- Working with the Teton County Fire District and other emergency management officials to assess zoning and development regulations for potential hazardous uses; and
- Using pamphlets and a website to educate the public on the risks of radon and about testing services and mitigation systems.

### City of Albany, Oregon

The City of Albany, Oregon, is located between the Cascade and Coast mountain ranges at the confluence of the Willamette and Calapooia rivers. The city is at risk to flooding, windstorms, severe weather, earthquakes, wildfires, and volcanic eruption. The State of Oregon requires each city and

county to adopt a comprehensive plan and the corresponding zoning and land-division ordinances needed to put the plan into effect. Within a city or county comprehensive plan, 19 statutory goals need to be addressed. The City of Albany Comprehensive Plan includes the mandatory hazardous area goal, provides hazard maps, hazard mitigation policies addressing flood events and steep slopes, and specific implementation methods for these policies. Going above and beyond the minimum requirement of including the mandated hazardous area goal within their comprehensive plan, the City of Albany is a noteworthy success due to its integration of hazard mitigation into the required housing goal. Often, hazardous area components are standalone chapters and are rarely integrated into other community goals and policies. However, the City of Albany addressed hazards within its future housing projections. The city calculated projected housing needs using various growth rate scenarios and then compared the results to the buildable land, which excludes floodplains, wetlands, and slopes. This example is a proactive long-term growth management success as the city successfully analyzed and determined that there was enough buildable land to meet the projected community's housing needs until 2025.

### City of Nome, Alaska

The City of Nome, Alaska, is in northwest Alaska on the southern tip of the Seward Peninsula. The city is at risk to coastline flooding, coastal storm surge, erosion, severe weather, and earthquakes. The State of Alaska allows municipalities to implement land use regulations, such as zoning or subdivision ordinances, but mandates that in order to do so, the municipality must first adopt a comprehensive plan by ordinance. This comprehensive plan has minimum requirements that include statements of policies, goals, and standards; a land use plan; a transportation plan; a community facility plan; and implementation recommendations. The City of Nome goes above the minimum requirement by including not only a hazardous area chapter, but one of which is completely designated to the standalone HMP. This integration technique is noteworthy given the rarity amongst comprehensive plans to contain detailed contents of an HMP. Likewise, it is rare for the HMP process to be directly cited within a hazardous area chapter in comprehensive planning. This ensures consistency between the two plans and can lead to an increase in the implementation of hazard mitigation policies within the city.

### Kittitas County, Washington

Kittitas County is in the center of Washington State, starting in the high Cascade Mountains and extending east to the Columbia River. The county is at risk to severe weather, earthquake, flood, avalanche, landslide, and wildfire. The State of Washington adopted the Growth Management Act (GMA), which provides various tools and strategies to manage growth, protect rural character, protect critical areas, and conserve natural resources. The GMA's detailed policy framework requires fast-growing cities and counties to address 14 goals within their comprehensive plan. These goals include housing; capital facilities; utilities; transportation; rural lands (for counties); and shoreline chapters (if applicable). The GMA also requires the designation and protection of critical areas and the designation of natural resource lands. By adopting the local HMP by reference within the comprehensive plan, Kittitas County goes above the minimum requirements to provide information, goals, and policies related to frequently flooded areas and geologically hazardous areas. Kittitas County's adoption of the HMP is noteworthy as comprehensive plans often omit HMP reference and only provide general information relating to hazards, making it difficult to plan for growth while simultaneously attempting to reduce the risk from hazard events.

## V. Review of Current Countywide Practices for Integration of Hazard Mitigation and Growth Management

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Ada County and Canyon Counties and their incorporated cities currently plan for hazard mitigation through comprehensive planning and other growth management mechanisms. This section provides an overview of countywide practices that are foundational for the recommended growth management strategies and tools for implementation put forth in the next section of this plan. This implementation plan focuses on a bioregional approach to hazard mitigation and sustainable growth management; therefore, practices were reviewed at the county level to provide a more holistic measure of what strategies and tools for implementation are present within the Lower Boise Watershed.

### Hazard Mitigation Integration through Comprehensive Planning

#### Ada County

Ada County incorporates hazard mitigation within five chapters of its 2007 comprehensive plan. These chapters include natural resources and hazardous areas, school facilities and transportation, land use, recreation, and community design. Within the hazardous areas chapter, descriptions of current conditions and corresponding location maps for each sensitive land type are provided. Sensitive lands include wildlife habitat, steep slopes, the 100-year floodplain, wetlands, and creeks. The county also includes a goal statement for hazardous areas, as well as a goal statement addressing floodplains. These statements are provided below, followed by a table of hazardous area policies and implementation methods included in the Ada County Comprehensive Plan regarding hazard mitigation:

- Protect human life and property to reduce public and private expenditures resulting from floods.
- Protect public health and safety by guiding growth and development away from hazardous areas that pose a threat to people and property by establishing appropriate safety standards for uses permitted in, or adjacent to hazardous areas.

Stated in the school facilities and transportation chapter, schools should not be located within the designated floodplains. The land use chapter states that residential development may be denied and density may be limited or may be transferred where hazards exist. PUD development should also not be located in hazardous areas unless it can be shown that it may occur without threatening public health and safety. Additionally, PUDs should always be in conformance with specific safety standards if located within urban/rural interface lands, floodplains, and other overlay districts. The recreation chapter of the comprehensive plan states that recreation area acquisition (e.g., open space, trails, etc.) should target hazardous areas where development would be detrimental to the health and safety of the public. Lastly, within the community design chapter, sustainable design is encouraged for stormwater systems and natural resource protection, which may help prevent flooding in the county.

**Table 1. Hazardous Area Policies in Ada County Comprehensive Plan**

Work with other jurisdictions to retain the floodway of the Boise River in a natural state as a greenbelt, wildlife habitat and open space-recreation area.

Tributary floodways will only be used for open space purposes (i.e., without buildings, parks, golf courses, ball fields or other physical improvements).

Allow limited development within the 100-year floodplains. Such development should not restrict or alter the natural flow of water within the floodway nor otherwise increase the size of the existing floodplain and should incorporate flood-proofing measures specified by FEMA. Minimum setbacks from the floodway and minimum rise above Base Flood Elevation (BFE) should be established. The developer of any development within the 100-year floodplain should be required to provide notification to prospective buyers that the property is within a floodplain or alluvial fan by deed restriction or other similar method.

Development should not be allowed on the alluvial fans of the foothill tributary at the point where the tributary exits the canyon, gulch, watershed, etc. Development should be allowed on the remaining alluvial fans of the tributary floodplains if adequately floodproofed. Such development should not alter the flow of water onto surrounding properties not originally designated as being in the floodplain. The developer of any development within the 100-year floodplain should be required to provide notification to prospective buyers that the property is within a floodplain or alluvial fan by deed restriction or other similar method. Twice the normal setbacks from the floodway should be established for foothill tributaries to protect homeowners from floods/debris flows resulting from a burned-out watershed.

Where properties subject to county development standards are partly within the 100-year floodplain, provide for reasonable density transfers so that the flood-free portion of such parcels can take the development that would otherwise have been permitted in the floodplain.

Prohibit the location of critical facilities, e.g., school buildings, hospitals or other medical facility buildings, within the floodplains. Require any buildings located within the floodplain to meet FEMA and other safety and mitigation requirements, including mitigation of floodwater displacement that could adversely impact surrounding uses.

Planning of major transportation routes should take into consideration the hazards of locating in floodplain areas.

Maintain/update the county's map of rural/urban interface lands that pose a high wildfire risk to people and resources.

Adopt fire safety standards for new construction and access in rural/urban interface lands, where fire protection is inadequate or unavailable, to reduce the threat of loss of life and property from wildfire hazards.

**Table 2. Hazardous Area Implementation Strategies in Ada County Comprehensive Plan**

Establish buffers and development standards to protect existing terrain, steep slopes, benches, floodways, habitat areas, and ridge lines.

Update county zoning ordinances and other requirements to ensure consistency with Comprehensive Plan policies related to floodplain protection.

Establish a minimum setback from the floodway in the county code for unincorporated portions of Ada County to help extend the Boise River Greenbelt.

Update county zoning ordinance requirements to ensure consistency with policies in this plan related to erosion, stormwater, runoff, and impacts on water quality. Adopt "Best Management Practices" to control erosion and protect water quality.

Define and map hazardous areas

Adopt fire safety standards for new construction and access in rural/urban interface lands, where fire protection is inadequate or unavailable, to reduce the threat of loss of life and property from wildfire hazards. Require plans to be prepared by a fire protection engineer for development in the wildland urban interface area.

## Canyon County

Canyon County incorporates hazard mitigation within the hazardous area chapter of its comprehensive plan. Within this chapter, current conditions are provided, including a list of waterways located in the floodplain and corresponding location maps of the FEMA regulatory floodplains. Canyon County

provides two goal statements within the comprehensive plan regarding hazard mitigation. These statements are provided below, followed by a table with hazardous area policies and implementation methods included in the Canyon County Comprehensive Plan regarding hazard mitigation:

- Ensure safety of residents and the protection of property, and
- Carefully consider limiting development in hazardous areas.

**Table 3. Hazardous Area Policies in Canyon County Comprehensive Plan**

Carefully consider requests to place structures in floodplain areas.
Discourage development in or near natural hazardous areas, such as airports, power line corridors, electrical substations, floodplains, unstable soil areas and steep slopes, and high velocity wind and storm prone areas, except for industries that may require these conditions.
Endeavor to limit structures and developments in areas where known physical constraints or hazards exist. Such constraints or hazards include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• Flood hazards;</li> <li>• Unstable soil and/or geologic conditions; and</li> <li>• Contaminated groundwater.</li> </ul>
Hillsides may be considered sensitive areas to be protected from excessive runoff or erosion.
Carefully consider new or expanding development or activities that use, produce, store, or dispose of toxic, explosive or other hazardous materials that should be in areas with adequate health and safety protection.
Discourage development near solid waste disposal areas unless it is an ancillary use.

**Table 4. Hazardous Area Implementation Strategies in Canyon County Comprehensive Plan**

Update county zoning ordinance and other requirements to ensure consistency with Comprehensive Plan policies related to floodplain protection.
Participate in efforts to create a countywide drainage plan, consistent with policies of this Plan.
Update county zoning or other regulations, as needed, to ensure consistency with policies of this section of the Comprehensive Plan.
Define and map hazardous areas.

## Hazard Mitigation Integration through Other Growth Management Mechanisms

### Ada County

Ada County integrates hazard mitigation into other growth management strategies including, but not limited to, the adoption of hazard overlay districts, variance regulations, subdivision and PUD regulations, building codes, and participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) programs. Within the Ada County Code, four overlay districts have been adopted including a Flood Hazard Overlay District, a Boise River Greenway Overlay District, a WUI Overlay District, and a Hillside Overlay District. Specific design standards and application processes are required for development, as defined by each ordinance, within these overlay districts. Also stated are prohibited uses, variance standards, and appeal processes. For example, within the WUI Overlay District, any new construction, alteration, moving, or change of use of a habitable structure requires establishing

a minimum 50-foot defensible space around the perimeter of any habitable structure for vegetation control to mitigate losses to life and property from wildfire hazards.

Also included within Ada County's Code are specific hazard regulations for subdivisions and PUDs. Throughout the subdivision and PUD application process, a natural features analysis must be completed for hazardous areas, as well as other features regarding topography, soils, hydrology, etc. Once a subdivision or PUD is approved that will be located within a hazardous area overlay district, the developer must also comply with specific design standards and requirements, such as elevating habitable structures above the BFE in the Flood Hazard Overlay District. PUDs must also apply for a comprehensive plan amendment in order to analyze existing site conditions and regional impacts from the proposed development to determine the appropriateness of the location and the feasibility of the proposed planned community subarea's success. With this application, a map and written assessment of known hazards must be completed.

Building codes are another mechanism that integrate hazard mitigation into growth management. Ada County has adopted the following building codes that reference hazard-specific construction standards:

- 2012 International Building Code (IBC)
- 2012 International Residential Code (IRC)
- 2012 International Wildland-Urban Interface Code (IWUIC)

Ada County amended portions of these codes to include increased snow load standards and design requirements referenced within the Flood Hazard Overlay District, as well as designating standards that conform to Seismic Class C Zone. The county also adopted the Vegetation Management Plan and Fire Severity Form Appendices from IWUIC.

The NFIP facilitates the installment and adoption of flood insurance in communities that voluntarily adopt and enforce floodplain management ordinances for new development within the 100-year regulatory floodplain. The CRS program allows communities to implement mitigation measures for reduced insurance premiums for NFIP policy holders. Ada County and the Cities of Boise, Eagle, Garden City, Kuna, Star, and Meridian participate in the NFIP, while participation in the CRS is limited to Ada County (Class 6) and the Cities of Boise (Class 6), Eagle (Class 6), and Garden City (Class 8).

## Canyon County

Canyon County integrates hazard mitigation into other growth management strategies including, but not limited to, the adoption of a hazard overlay zone, variance regulations, subdivision and PUD regulations, building codes, and participation in the NFIP. Within the Canyon County Code, a Flood Hazard Overlay Zone has been adopted. Specific design standards and application processes are required for development and are defined by the ordinance within this overlay zone. For example, any new construction or substantial improvements of an existing structure must be anchored to prevent flotation, collapse, or lateral movement of the structure. This and other design standards in the Flood Hazard Overlay Zone have been adopted in order to mitigate losses to life and property from flood hazards. Also stated in the ordinance are flood hazard term definitions, variance standards, appeal processes, and penalties for violations.

Also included within Canyon County's Code are specific hazard regulations for subdivisions. A natural features analysis for hazardous areas, as well as other features regarding topography, soils, hydrology,

etc. must be completed and submitted with the preliminary plat. Specific floodplain regulations also apply to subdivisions that require floodplain mapping, justification for the location of the development within the flood hazard area, and floodproofing plans for habitable structures within the subdivision. Canyon County adopted additional subdivision regulations for areas of critical concern, which state that subdivisions located in areas previously designated as a concern may need to provide justification of the development's necessity and desirability in the public interest. If designated an area of concern, an environmental assessment analyzing the development's detrimental effects, corrective action or alternative plans, and adverse effects that cannot be mitigated may also be required.

Canyon County adopted the following building codes that reference hazard specific construction standards:

- 2012 International Building Code (IBC)
- 2012 International Residential Code (IRC)

Within the Residential Building Code, there are also specific building regulations for the designated Class B Seismic Zone.

Canyon County also participates within the NFIP. The participating communities include Canyon County and the Cities of Caldwell, Middleton, Nampa, Notus, and Parma. Canyon County and its incorporated areas do not participate in the CRS program.

## VI. Recommended Strategies and Tools for Implementation

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The following implementation strategies and recommendations provide opportunities for Ada County and Canyon County to strengthen the use of mitigation coincident with the growth management process, to reduce vulnerability and risk, and to increase community resilience. These recommendations align with current desired implementation actions put forth by both counties and were formulated from hazard planning research and best practices.

### Incorporate Hazard Mitigation into Multiple Components of the Comprehensive Plan

Idaho's LLUPA requires each city and county to prepare a comprehensive plan that guides the growth of the community through land use planning. Within a comprehensive plan, it is required to include current conditions and future desired conditions for 17 different components. One of these components must be designated to natural hazards; however, natural hazard mitigation can be incorporated into multiple components of the comprehensive plan. Examples of this incorporation include, but are not limited to, incorporating hazard mitigation into the following components:

**Land Use.** Hazard mitigation can be incorporated into the land use component of the comprehensive plan by clearly identifying the natural hazard areas, designing policies to discourage development or redevelopment within natural hazard areas, and designing policies at providing adequate space for expected future growth in areas outside natural hazard areas.

**Transportation.** Hazard mitigation can be incorporated into the transportation component by designing policies that limit access to hazard areas and by guiding growth to safe locations; designing policies that aim at having facilities function under disaster conditions (e.g., evacuation); and designing policies to have contingencies in place in case of bridge or other transportation infrastructure failure.

**Property Rights.** Hazard mitigation can be incorporated into the property rights component by designing policies that balance private property rights and hazard mitigation, designing policies that aim at making partnerships and/or agreements between landowners and local governments for use of land for hazard mitigation, and designing policies to reduce conflict or provide mediation during hazard mitigation disputes.

**Natural Resources and Environment.** Hazard mitigation can be added to the natural resources and environment component by providing a list or map of environmental systems that protect development from hazards, designing policies to maintain and restore protective ecosystems, designing policies to provide incentives for development located outside protective ecosystems, designing policies to limit development in flood prone areas, designing policies to protect wildlife migration corridors along rivers and streams to serve as habitat and environment protection, designing policies to preserve natural vegetation and woodlands on steep slopes to reduce the likelihood of landslides, and designing policies to conserve woodlands without development to reduce building exposure to wildfires. Hazard mitigation can also be coupled with environmental policies (e.g., clean air, clean water, endangered species) and watershed management policies.

**Recreation and Open Space.** Hazard mitigation can be incorporated into the recreation and open space component by designing policies to convert or contain floodplain land, steep slope,



and areas vulnerable to wildfire or other hazards into open space or recreational areas to minimize damage to life and property.

**Economic Development.** Hazard mitigation can be incorporated into the economic development component by providing a list or map of business locations that are within hazardous areas, designing policies to provide adequate space for expected business growth in areas located outside natural hazard areas, designing policies to aid economic recovery post-disaster, designing policies to educate business owners about hazards and their risks, designing policies to assist business owners with hazard mitigation and preparedness, and designing policies to use the community's safety to attract potential new businesses to the area.

**Population.** Hazard mitigation can be incorporated into the population component by providing a list or map of populations within hazardous areas, providing a list or description of populations that are socio-economically vulnerable, designing policies to educate the public about hazards, designing policies to assist the public with hazard mitigation and preparedness, designing policies to aid the public with post-disaster recovery, designing policies that protect the public from risk to natural hazards, and designing policies to develop response plans for natural hazard events.

**School Facilities and Transportation.** Hazard mitigation can be incorporated into the school facilities and transportation component by providing a list or map of school facilities within hazardous areas, designing policies so that school facilities are designed to function under disaster conditions, designing policies in order to utilize school facilities in safe areas as emergency shelters, designing policies that provide contingencies in case of school facility or transportation infrastructure failure, and designing policies for locating future facilities outside of hazardous areas.

**Public Services, Facilities, and Utilities.** Hazard mitigation can be incorporated into the public services, facilities, and utilities component by providing a list or map of public facilities within hazardous areas; designing policies to limit public expenditure for infrastructure and public facilities in high-hazard areas; designing policies that link water treatment facilities, stormwater management, and sewer and solid waste with hazard mitigation; designing policies to interconnect service networks and allow more than one route to any point in order to reduce vulnerability when failures do occur; designing capital improvement policies that steer development away from hazardous areas; designing policies that aim for the safe location of critical facilities outside of hazardous areas; designing policies that aim to have facilities function under disaster conditions; and design policies that utilize other major facilities in safe areas as emergency shelters.

**Special Areas or Sites.** Hazard mitigation can be incorporated into the special areas or sites component by providing a list or map of special sites or areas within hazardous areas, designing policies that aim to apply appropriate hazard retrofitting techniques or standards to protect historic or other special site structures from hazard events, and designing policies in order to protect special areas or sites that may double as hazard mitigation (e.g., wildlife refuges, wetlands).

**Housing.** Hazard mitigation can be incorporated into the housing component by providing a list or map of housing developments within hazardous areas, and by designing policies that aim to

use appropriate hazard retrofitting techniques for current or future housing located within hazardous areas or that aim to discourage development or redevelopment in hazard areas.

**Community Design.** Hazard mitigation can be incorporated into the community design component by designing policies that aim to use design standards that are appropriate for housing located within hazardous areas or that aim to discourage development or redevelopment within hazardous areas.

**Agriculture.** Hazard mitigation can be incorporated into the agriculture component by designing policies to adopt agricultural techniques that help prevent, mitigate, or reduce the risk of impacts from hazard events; designing policies that aid the agricultural sector with recovery post-disaster; and designing policies that educate agricultural landowners about preventative measures they can implement to reduce risk to hazard events. These measures include, but are not limited to, the following:

- Storing hay bales and equipment in areas less likely to be flooded;
- Installing ponds or swales to capture stormwater;
- Planting vegetation that can tolerate inundation; and
- Land management practices to improve the capability of the soil to retain water.

**Public Airport Facilities.** Hazard mitigation can be incorporated into the public airport facilities component by providing a list or map of current airport facilities within hazardous areas; designing policies aimed at retrofitting current facilities or developing future airport facilities and infrastructure that adhere to multi-hazard building codes; designing policies to encourage the creation of emergency response plans for airport facilities during disasters; designing policies that aim to utilize facilities in safe areas as emergency shelters and for those facilities that are located within hazard areas; and making sure the airport facilities can function under disaster conditions. Lastly, policies should be aimed at developing contingencies in case of airport facility infrastructure failure.

## Form Based Codes

Ada County and Canyon County have large swaths of incorporated areas along the Boise River and its tributaries. Within Ada County, the Cities of Boise, Garden City, and Eagle have an estimated 3,000 structures (valued at approximately \$1.5 billion) within the 100-year floodplain and an estimated 7,000 structures (valued at approximately \$4 billion) within the 500-year floodplain. Within Canyon County, the Cities of Parma, Middleton, and Caldwell have an estimated 180 structures (valued at approximately \$12 million) within the 100-year floodplain and an estimated 400 structures (at approximately \$30 million) within the 500-year floodplain. Development is expected to continue in both counties, either in the form of new community development or infill development, therefore the adoption of a Form Based Code (FBC) for development that occurs in the floodplain may be ideal for mitigating risks from local hazards while promoting a certain character for each community. Floodplain design standards can be incorporated into a FBC through the explication of specific material and design standards for buildings or through the inclusion of floodplains as open/public space. For example, if a floodplain is used as open space within a FBC, it might be defined as the following:

“An Open Space for informal walking and recreation. It may be largely left in a natural state, but may be managed in terms of vegetation. It may also include, with special approval, facilities that

can withstand periodic flooding. Residential homes or commercial uses must face the flood plain directly or immediately across a street in order to count toward the minimum open space requirement. There is no minimum size.”

An FBC may also be applied for the relocation of communities from the floodplain to new communities outside of hazardous areas that are similar to their traditional urban or rural form, which may then provide desirable places to resettle and re-establish business.

An FBC is designed to place the ultimate physical form in a superior position to the use to which individual property can be put. The goal of this type of code is to be prescriptive and promote a certain type of development, rather than prohibit development. FBCs provide a comprehensive set of design standards that emphasize specific building design, rather than the separation of uses. Often, they create districts that are driven by the market where a variety of buildings coexist within a neighborhood. Generally, these neighborhoods are achieved through a number of factors including the following:

- The abandonment of most use restrictions;
- The regulation of maximum, instead of minimum, setbacks from public rights of way; and
- The requirement of minimum height limits instead of maximum height limits.

Adopting FBCs can be a difficult process, and transitioning to this type of code can be cumbersome when it is implemented after a traditional zoning code. These codes can also present a steep learning curve for citizens, officials, and developers, and creating a new FBS can be expensive and time consuming. With these challenges in mind, implementing an optional FBC that functions as an overlay to the existing zoning code but is mandatory for development occurring in the 100-year floodplain can be recommended in place of implementing a full-scale mandatory FBC. Furthermore, using the SmartCode (a comprehensive model form-based code) can provide a foundation for the development of an FBC in Ada County and Canyon County and their incorporated cities within the floodplain. The SmartCode code can be found at <http://smartcodecentral.com/>.

Authority for the adoption of FBCs are rooted in the 1926 Standard State Zoning Enabling Act. The “Grant of Power” provisions in this act anticipate that local government can explicitly consider the form of development, as well as regulate the use of structures and land. Idaho’s LLUPA also provides specific statutory authority for FBCs, through section 67-6518, which states that:

“Each governing board may adopt standards for such things as: building design; blocks, lots, and tracts of land; yards, courts, greenbelts, planting strips, parks, and other open spaces; trees; signs; parking spaces; roadways, streets, lanes, bicycleways, pedestrian walkways, rights-of-way, grades, alignments, and intersections; lighting; easements for public utilities; access to streams, lakes, and viewpoints; water systems; sewer systems; storm drainage systems; street numbers and names; house numbers; schools, hospitals, and other public and private development.”

There are however potential legal challenges to the adoption of FBCs, including infringement on the First Amendment’s right of expressive activity and Procedural Due Process. To remedy the former, the governing board must ensure that form-based code regulations constitute a broad tool to shape public space, infill neighborhoods, and reduce greenhouse gases and climate change to control sprawl impacts rather than as an architectural design regulation. To remedy the latter legal challenge, if a form-based code regulatory plan is confined to a single property, the governing board may be required to hold a quasi-judicial hearing with full procedural due rights given to the land owner to cross-examine witnesses

and to present oral or documentary evidence.

## Transfer of Development Rights

TDR is a program based on the concept that property rights consist of many types of rights, including development rights, that can be used, unused, transferred, or sold separately by the owner of the parcel. The overall premise of the program is to provide economic benefit to landowners of sensitive lands by a means other than the development of that particular land. TDR programs separate the development potential of these sensitive lands and create a market where this development can be transferred or sold in order to receive the economic benefit the landowner otherwise would have had if they developed on the original property. In order to be a successful program, TDRs should have designated sending and receiving zones. Sending zones are generally easy to identify by local communities, as they are the lands that are environmentally sensitive or have the highest risk to natural hazards. Identifying receiving zones, on the other hand, is a more complicated task. These zones must be growing areas with a market demand for increased density. Potential sending and receiving zones should also be consistent with goals of the comprehensive plan put forth by the community.

The Lower Boise Watershed Risk Report can help identify potential sending and receiving areas for flood, earthquake, fire, and landslide areas, depending on which hazard poses a greater risk to individual communities. After analyzing the results of the risk assessment, the City of Eagle presents itself as an ideal case for a pilot TDR program due to the city's current rate of development and proximity to the Boise River. The City of Eagle has an estimated 11 structures (valued at approximately \$6.5 million) within the 25-year floodplain and an estimated 1,000 structures (valued at approximately \$600 million) within the 500-year floodplain. Additionally, the majority of these structures are located within residential areas and show high estimated flood losses. Figure 1 shows these areas with estimated flood losses that could be used as potential sending zones.



Figure 1. Example location of a sending area in the City of Eagle

The structures overlaid with red dots indicate damage in the 100-year flood event, with the dark shades indicating higher building losses.

This Implementation Plan does not identify potential receiving zones, however, so that speculation in relation to property values does not occur. Therefore, it is suggested that if the City of Eagle adopts a TDR program, local officials require that any interested property owner must show how their property meets the criteria of a receiving site for approval. Neighborhood land owners would then be notified, and public hearings would be held once a receiving area is proposed.

Although the City of Eagle presents itself to be an ideal pilot case for a TDR program, there are multiple factors that must be considered for a TDR program to be successful. There must be a balance between sending and receiving zones. If there are too many TDRs on the market, the price falls and the fairness of the TDR program is questioned. Additionally, receiving zones must be growing areas with a market demand for increased density. In a free market, the value of the TDR will be set near the marginal value of that increased density. However, if landowners in receiving zones can more easily increase density through variances or rezones, the TDR market may fail.

The implementation of TDR programs can also present legal concerns presented through “taking” challenges under the Fifth Amendment. In *Suitum vs. Tahoe Regional Planning Agency*, the Ninth Circuit found that a TDR may be considered a “use” of property for the purposes of a “takings” challenge, and that a landowner must first pursue their rights under this program. However, the U.S. Supreme Court overturned this ruling and determined that TDRs cannot replace the entire right to develop one’s property, but rather can form a proper part, or indeed the entirety, of the full compensation a land owner is accorded when their property is taken or uses are prohibited. To help mitigate these concerns, local governmental officials should use the Attorney General’s Regulatory Takings Checklist when



evaluating the potential impact of a TDR program and its impacts on specific property.

## Future Acquisitions Map

Idaho's LLUPA presents the authority to cities and counties to adopt, amend, appeal, or repeal a future acquisitions map in accordance with the notice and hearing procedures provided in section 67-6509, Idaho Code. The map shall designate land proposed for acquisition by a public agency for a maximum of 20 years. Lands that may be designated on this acquisition map include the following:

- Streets, roads, other public ways, or transportation facilities proposed for construction or alteration;
- Proposed schools, airports, or other public buildings;
- Proposed parks or other open space; and
- Lands for other public purposes.

Ada County and Canyon County can utilize the Lower Boise Watershed Risk Report and partner with local, State, or Federal agencies (e.g., Idaho Fish and Game, Idaho Parks and Recreation, City of Boise Parks and Recreation, etc.) to identify hazardous areas and designate them on a Future Acquisitions Map. Mapping hazard areas on a future acquisitions map can help recognize the link between conservation of open space and risk reduction to property and life. Areas to potentially identify in plan maps include the following:

- Steep slopes;
- Flood hazard areas;
- Wildland-urban interface;
- Subsidence zones;
- Avalanche paths;
- Unstable soils; and
- Other geologic hazard areas.

## Wildland-Urban Interface Overlay District and International Wildland-Urban Interface Code

Idaho's LLUPA gives the authority to cities and counties to adopt zoning ordinances through section 67-6511, Idaho Code. Included within this authority is the ability to adopt Overlay Zones. Overlay Zones, also known as Overlay Districts, are areas that add additional zoning requirements in response to a particular need or concern. One such concern is natural hazards including, but not limited to flood, landslide, wildfire, and earthquake. Overlay Districts are beneficial as they provide flexibility to traditional zoning to respond to additional needs or concerns not limited by use. Additionally, the creation and implementation of Overlay Districts are straightforward and familiar to planning staff, developers, and residents, and are generally politically and publicly acceptable. Based on the results of the risk report, it is suggested that Canyon County adopts a Wildland-Urban Interface (WUI) Overlay District, as the entirety of the county is located within a portion of the WUI. An estimated 106 structures (valued approximately \$22 million) are exposed to high fire risk in unincorporated areas of Canyon County. Additionally, more than an estimated 48,000 structures (valued at approximately \$5.3 billion) are exposed to moderate fire risk in all incorporated and unincorporated areas of the county. Canyon County's neighboring Ada County has adopted a WUI Overlay District, which can act as a foundation and a starting place for the creation and implementation of this hazard overlay zone. Included within a WUI

Overlay District is the purpose and applicability of the district, standards for vegetation control, private roads, new subdivisions and PUDs, as well as declared prohibited uses. During the creation and adoption of this WUI Overlay District, Canyon County should consider the following challenges:

- Overlay zones add another layer of review and regulation to the permitting process;
- Overlay zones can introduce a set of requirements that may be challenging or even impossible to adhere to given underlying zoning requirements; and
- Overlay zones, if too restrictive, can curtail the reasonable use of property, which can lead to a regulatory taking challenge.

In addition to adopting a WUI Overlay District, it is ideal that Canyon County adopt the 2012 International Wildland-Urban Interface Code to supplement the overlay district. The purpose of this code is to mitigate the wildfire hazard through model code regulations that safeguard the public health and safety in all communities, large or small. The WUI Code establishes minimum regulations for land use and the built environment in designated WUI areas using prescriptive and performance-related provisions. Canyon County can either look to neighboring Ada County for assistance in creating and adopting this code, or the WUI Code itself can provide assistance through the provision of bracketed words in the code and sample ordinance where Canyon County can insert the information needed. The WUI Code can be found at <http://shop.iccsafe.org/media/wysiwyg/material/3850X12-toc.pdf>.

## Participation in the Community Rating System

FEMA's CRS is a program that recognizes community efforts beyond the minimum standards by reducing flood insurance premiums for the community's property owners. The CRS can discount flood insurance from five percent up to 45 percent depending on the number and type of activities the community implements. Based on the results of the risk report and overall NFIP community characteristics, Canyon County and its incorporated cities present an ideal case to join the CRS program. As of September 28, 2017, Canyon County had a total of 636 insurance policies, totaling over \$150 million in insurance coverage.

**Table 5. Canyon County Flood-Related Community Characteristics**

COMMUNITY NAME	NFIP STATUS	CRS STATUS	FLOOD CLAIMS**	CLAIMS PAID	REPETITIVE LOSS PROPERTIES	TOTAL NFIP POLICIES**	TOTAL INSURANCE COVERAGE
City of Caldwell	Yes	No	0	\$0	0	12	\$3,500,000
City of Greenleaf	No	-	-	-	-	1	\$280,000
City of Middleton	Yes	No	8	\$37,075	0	95	\$18,837,800
City of Nampa	Yes	No	1	\$5,687	0	210	\$53,116,800
City of Notus	Yes	No	0	\$0	0	7	\$1,143,200
City of Parma	Yes	No	0	\$0	0	16	\$4,229,900
City of Star*	Yes	No	0	\$0	0	41	\$9,735,300
City of Wilder	No	-	-	-	-	-	-
Unincorporated	Yes	No	6	\$52,657	0	254	\$59,843,600

COMMUNITY NAME	NFIP STATUS	CRS STATUS	FLOOD CLAIMS**	CLAIMS PAID	REPETITIVE LOSS PROPERTIES	TOTAL NFIP POLICIES**	TOTAL INSURANCE COVERAGE
<b>Total</b>	-	-	15	\$95,419	0	636	\$150,686,600

\*Star is in both Ada and Canyon Counties. The value shown is the total number for the city.

\*\*As of 09/28/2017

In order to get credit for participation in the CRS, local officials within the community will need to prepare an application documenting its efforts. Additionally, it is likely that Canyon County and incorporated cities are already participating in qualifying activities, such as the maintenance of elevation certificates, making the transition into the program within community capabilities. Listed below are examples of 300-level activities that can provide a starting point for participation in the CRS for Canyon County.

- Maintain FEMA elevation certificates for new construction in the floodplain (required for CRS);
- Provide FIRM information to people who inquire, and publicize this service;
- Send information about the flood hazard, flood insurance, flood protection measures, and/or the natural and beneficial functions of floodplains to flood prone residents or all residents in the community; and
- Give inquiring property owners technical advice on how to protect their buildings from flooding, and publicize this service.

### **Appreciative Inquiry: Asset Based Workshop during next HMP Update Process**

In order to maintain eligibility for FEMA mitigation grant funds, HMPs must be updated every five years. This update process must include an open public involvement process constituting a more comprehensive approach to reducing the effects of natural hazards. However, due to the complex and technical nature of hazards planning, participation is often low in communities. This presents opportunity to implement the “Appreciative Inquiry Approach” developed by Freitag et. al 2014, in which the goal is to highlight local assets that promote well-being and adaptive capacities for recovery after an imagined disaster with a focus on non-hazard community factors.

This approach could be adapted and used for Ada County and Canyon County during their next HMP update in order to prioritize mitigation actions and increase public support and participation. This process entails holding community workshops where the public would participate in two mapping exercises. The first of the two mapping exercises prompt the public to identify community assets that are important to their wellbeing during everyday life. The second of the two mapping exercises prompts the public to identify community assets that they feel are important during a disaster scenario. After the completion of these two mapping exercises, local officials and stakeholders can identify the overlapping areas and assets in the two maps and consider them to be AOMI in the HMP.

### **Funding Opportunities**

The costs of mitigation actions and projects can vary from minimal to many millions of dollars. Structural and critical infrastructure projects often require financial assistance. However, funding is often cited as the limiting factor in the successful implementation or completion of a risk-reducing action.



Departmental and agency funds can be limited and pre-allocated to non-mitigation activities, while grants and other sources of funding are ignored or unknown.

Therefore, it is important that the communities of the Lower Boise Watershed coordinate and actively seek financial assistance for mitigation actions. This assistance can come in the form of grants, loans, technical assistance, or in-kind contributions. Given the complexity of financial assistance, it is recommended that the communities of the Lower Boise Watershed designate a point of contact or committee for seeking out, applying, and distributing grants and other funds. Such designation or committee should work across local, State, and Federal institutions, and keep a shared calendar of important dates for grants and other sources of funding. Likewise, this position can help communities identify any initiatives or activities that can be accomplished using existing programs or budgets.

Examples of funding opportunities include the following:

- State funding and assistance through Hazard Mitigation Assistance including Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation (PDM);
- The National Earthquake Hazard Reduction Program (NEHRP) to increase and enhance effective implementation of earthquake risk reduction at the State and local level
- Cooperating Technical Partners (CTP) Grant Program to provide funding support for Risk MAP and NFIP projects.

Outside of grant assistance, technical support is available. Technical assistance can be requested through your State Risk MAP coordinator to help implement community engagement and outreach strategies, facilitate a decision-making process or present information to elected officials, and provide models for ordinance or plan updates and/or best practices for mitigation to reduce overall risk to natural hazards throughout and after the Risk MAP project lifecycle.

## Communicate Mitigation Successes

Communicating successfully completed mitigation actions and projects can help garner further support for continuing mitigation efforts. Communicating successes through public service announcements, newspaper and website articles, social media, and other avenues helps inform the general public of the risks in their community and the efforts undertaken to mitigate such risks. Likewise, communicating these successes can help garner institutional support by highlighting cost-effective and resource-efficient actions with the potential to reduce the monetary costs of hazards. It is recommended that the communities of the Lower Boise Watershed cooperatively develop a watershed-wide public outreach strategy and regularly communicate mitigation successes. Example outreach methods include the following:

- Participating in community events;
- Interviews;
- News media, including radio, newspaper, and television;
- Presentations to governing bodies;
- Social media;
- Community-specific meetings; and

- Website.

## CityEngine Scene Development

There is often a disparity in the understanding of hazards and risk between the general public and mitigation planners or responders. Public outreach and awareness programs can help communities overcome this disparity, which is important in mitigation and preparedness. A key component to these programs are visualizations. Oftentimes, this is limited to traditional maps, figures, and tables. Additional visualization in the form of a three-dimensional landscape scene that includes community assets and hazard extents can be a powerful addition to help educate the public, increase risk perception, and garner support for proposed mitigation actions and projects.

ESRI's CityEngine provides the means to create these three-dimensional scenes and more effectively visualizes the spatial relationships between populations and risks than a two-dimensional map (Figure 2). Using CityEngine, hazard exposure, socioeconomic vulnerability, and loss estimates can be shown relative to housing stock, critical facilities, and infrastructure. Potential and proposed mitigation actions can also be incorporated, producing a true-to-scale scene of protections and impacts.



Figure 2. Example application of a CityEngine scene with hazard overlays.

The utility of these scenes is not limited to public outreach, however, and can be an important analysis tool. CityEngine allows for accurate comparisons and analysis of buildings and building proposals in relation to hazards. For example, the Boise Foothills area is an ideal candidate for a CityEngine scene, given its exposure to landslide, wildfire, and earthquake. Vegetation, hazards, and current and proposed buildings can be modeled to both provide planners and policymakers data on the area's risks, as well as acting as a public outreach tool.

## MATSim Evacuation Model Analysis

Understanding evacuation times, patterns, and needs is vital to prepare for and mitigate against disaster. However, communities often lack an understanding of the evacuation capacity of the road network, hampering their ability to plan for and designate efficient evacuation routes. Bottlenecks can arise and impair the ability and efficiency of responders, producing cascading hazards that require further response and resources. Modeling clearance times provides insights into the factors that affect evacuation, such as limited ingress and egress, high population density, and evacuee mobility or special needs.

The MATSim evacuation model is a multi-modal evacuation model employing a methodology created by HazCIRC (Figure 3). The methodology has successfully modeled the evacuation patterns of populations across time and space in various locations across the United States and in different hazard conditions. The model accounts for who evacuates and when they choose to evacuate, the destination of the evacuees, the mode of transportation taken, and the route taken and the time required to arrive. The HazCIRC methodology takes into consideration special needs populations, such as transit-dependent and tourists, as well as other socioeconomic and demographic characteristics that impact evacuation, to provide a more holistic model.

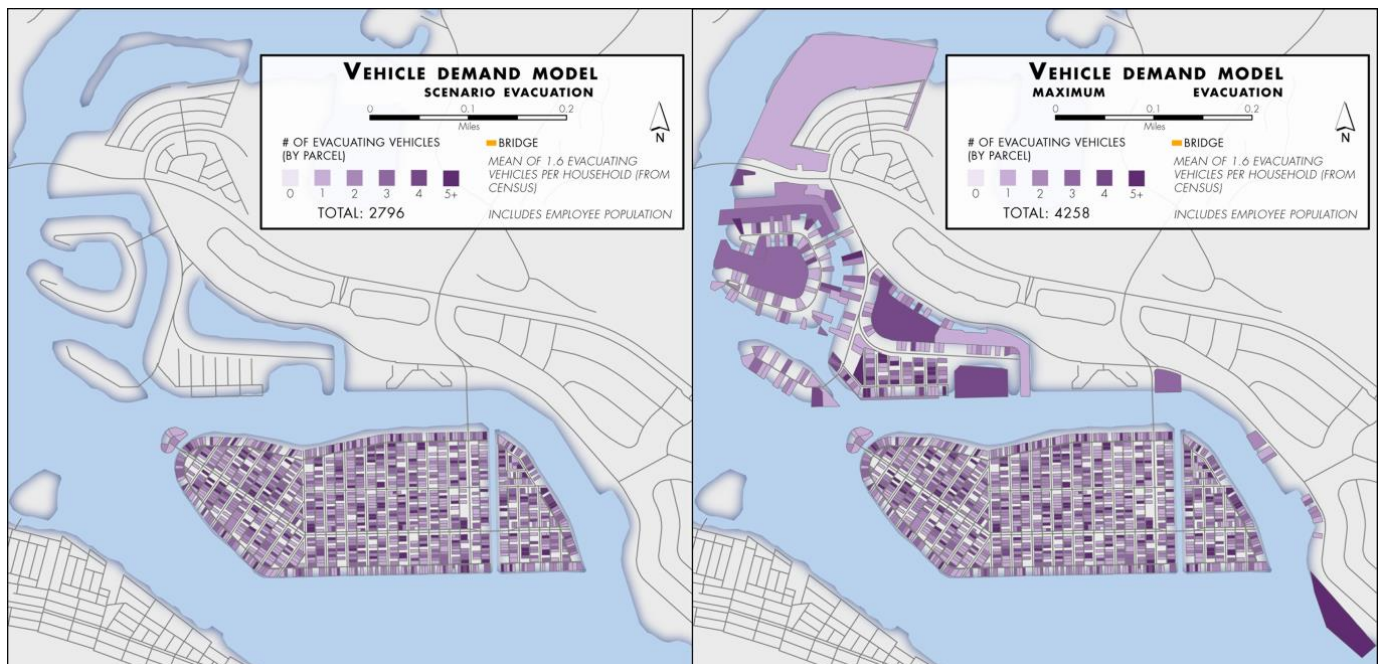


Figure 3. Example application of the MATSim evacuation model showing vehicle demand.



To address high-risk areas identified in the Lower Boise Watershed Risk Report, it is recommended that a MATSim evacuation model be developed for the Boise Foothills. The Boise Foothills are at risk to wildfire, landslide, and earthquake, and have limited ingress and egress given the area's topography. Although safe routes depend on the hazard and its location, the MATSim evacuation model can provide responding agencies with information on evacuation prioritization and areas of focus.

## Comprehensive Socioeconomic Vulnerability Assessment

Socioeconomic vulnerability is the predisposition of an individual or population to be negatively impacted by a hazard due to existing socioeconomic or demographic characteristics. For example, elderly populations are often more vulnerable to hazards due to challenged mobility, requiring additional evacuation time and special care. Likewise, female populations are more vulnerable than male populations to disasters due to family responsibilities and lower average incomes, making it more difficult for female populations (notably single parent female head of households with children) to recover. Understanding socioeconomic vulnerability is crucial in mitigation planning, yet it is often omitted in both risk assessments and mitigation strategies.

When socioeconomic vulnerability is accounted for, the model employed often lacks the sophistication to produce an accurate measure of vulnerability. These traditional models produce resolutions too coarse for sub-county mitigation efforts. Although appropriate for studies or plans written at the State- or nation-wide scale, these models are inappropriate for county or regional planning and analysis. Likewise, traditional vulnerability models are often generalized and do not consider the distinct local characteristics of a community, relying on general statistical analyses of demographic data collected in the decadal census. Finally, these models are often statistically incorrect and do not account for the spatial patterns and relationships of the indicators used as proxy measures of vulnerability.

To overcome these limitations, the Spatially Explicit Resilience-Vulnerability (SERV) model was developed by Dr. Tim Frazier at HazCIRC. This model addressed these limitations by accounting for local community characteristics, incorporating advanced spatial analysis and statistics, and producing sub-county results. The SERV model accounts for a community's ability to overcome stressors, its sensitivity to stressors, and the population exposed to various magnitudes of a hazard to produce a comprehensive vulnerability score. The SERV model was employed in the Lower Boise Watershed Risk Report to identify areas at greater risk to loss of lives and property from earthquake, flood, landslide, and wildfire. However, a more comprehensive and targeted vulnerability assessment should be undertaken to identify the underlying factors amplifying vulnerability.

The targeted socioeconomic vulnerability assessment should employ the Geographically-Weighted Spatially Explicit Resilience-Vulnerability (GWSERV) model (Figure 4). The GWSERV is an improvement on the SERV model and is the most advanced socioeconomic vulnerability model to date. The GWSERV employs geographically-weighted factor analysis to provide high-resolution localized analyses and results. The GWSERV does not simply produce a measure of vulnerability, but provides stakeholders and decision makers with the primary underlying socioeconomic and demographic indicators driving vulnerability (Figure 4). This knowledge and information is vital to best target mitigation efforts and to reduce community vulnerability and enhance community resilience.

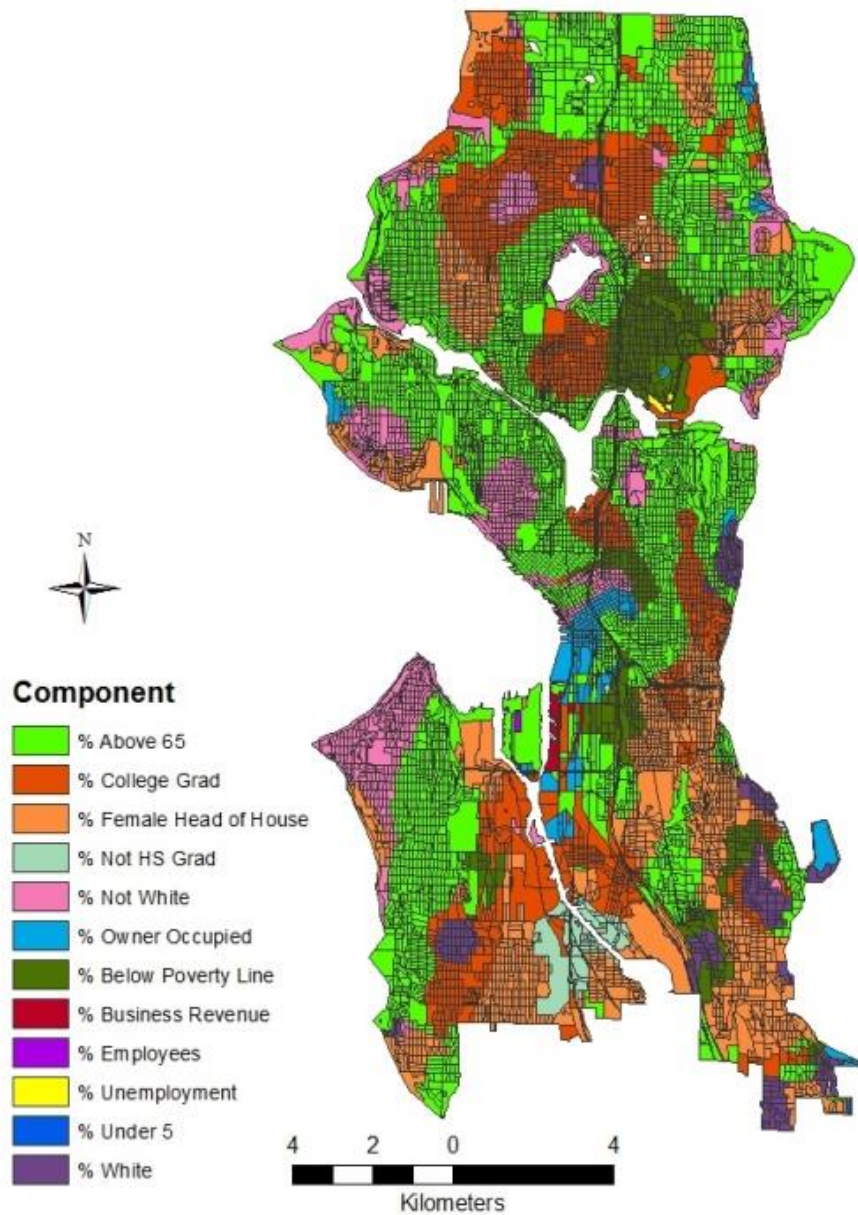


Figure 4. Example application of the Geographically-Weighted SERV model (GWSERV).

The GWSERV shows what factors have the greatest influence on a community's vulnerability.

## Improved GIS Mapping and Data Management

GIS mapping and data management are key to understanding risk, effectively targeting mitigation efforts, managing development for sustainability, and ultimately enhancing community resilience to hazards. GIS maps, in combination with high-quality data, provide the means to visualize the extent and magnitude of hazards, the potential losses if a disaster were to occur, and the location of vulnerable populations. GIS analyses can help improve the understanding of hazard impacts and can expose areas or populations of concern that might otherwise stay hidden. Such maps and data help identify and prioritize mitigation areas, and can likewise be used to assess mitigation areas of effect.

Given the utility of GIS maps and data, it is recommended that the communities within the Lower Boise Watershed maintain comprehensive and high-quality GIS data. Examples of data include, but are not limited to, the following:

- Building stock (with hazard-specific attributes);
- Historical hazard occurrences;
- Future hazard probabilities;
- Critical facilities and infrastructure data;
- Land use and zoning;
- Areas of city impact and future development;
- Socioeconomic vulnerability;
- Community assets;
- High potential loss facilities; and
- Geo-coding of mitigation actions.

Such data provides a foundation on which to build a comprehensive GIS program to reduce community vulnerability and enhance resilience. For example, developing a building stock dataset with hazard-specific attributes allows for the creation of User-Defined Facilities (UDF) for use in Hazus-MH loss estimations. The inclusion of UDFs produces more accurate results than the general building stock included in the software. However, like all modeling, the output and results of Hazus-MH loss estimations and other GIS models are dependent on the quality of the input dataset. Therefore, it is important to build datasets with appropriate levels of detail and accuracy. Building and using data that captures real-world conditions greatly increases its reliability and usability.

To maintain high-quality data, communities within the watershed can standardize and share data collection and archiving. Likewise, the counties and communities can format all newly-permitted construction records and assess existing construction records to create an accurate and standardized dataset of structures.

## Develop a Post-Disaster Recovery Plan

Although mitigation is vital to reducing community vulnerability and enhancing community resiliency, it is only one aspect of the disaster continuum. Another aspect that should be considered through the planning process is recovery following a disaster. Disaster recovery is defined by FEMA as a return of community systems and structures to a “normal state,” which is usually held as the pre-disaster state of

the community. Together, planning for both mitigation and recovery allows communities a more holistic approach to hazards and risk, and ultimately facilitate greater community resiliency.

To produce a holistic mitigation strategy, both Ada County and Canyon County and a cooperative watershed-scale group should prepare post-disaster recovery plans (PDRPs). The PDPR is the means to identify and plan for issues a community is likely to face after a disaster. The primary goals of a PDPR are to identify and prioritize key issues; establish partnerships within the community, with neighboring communities, and State and Federal agencies; develop a recovery strategy that can be implemented immediately following an event; and more effectively and efficiently allocate resources. Through the PDPR planning process, communities can also identify pre-disaster mitigation projects and enhance response and preparedness capabilities. Undertaken at both the county and watershed scales, PDRPs can greatly enhance the resiliency of the Lower Boise Watershed through a bioregional approach by building relationships vital in both the pre-, during-, and post-disaster periods, illuminating region-wide issues that may arise in the post-disaster period, and instituting a plan to seize the short-yet-vital window in the post-disaster period to enhance resiliency across multiple spatial scales.

To best formulate the PDRPs, the following strategies (but not limited to) should be included:

- Post-disaster recovery plans;
- Recovery ordinances;
- Business and government continuity plans;
- Post-disaster buildable lands inventories;
- Utility recovery and reconstruction plans;
- Temporary shelter, housing plans, and business plans; and
- Establishment of a coordinating organization and guiding principles for reconstruction.

## Climate Impacts Assessment

The impacts of a changing climate can be detrimental to a community, especially if the community is dependent on agriculture, seasonal precipitation, or is unable to cope with the degree of changes in climate systems. At the watershed-level, these impacts can translate to vegetative shifts, loss of critical wildlife habitat, changed precipitation regimes, increased wildfire, drought, severe storms, and more. Understanding watershed-level impacts and the cascading impacts on communities is important in preparing for, adapting to, and mitigating negative changes while providing opportunity for capitalizing on positive changes. A climate impacts assessment provides this understanding and is recommended for the Lower Boise Watershed.

A climate impacts assessment identifies the systems and processes within the watershed and its communities that are affected by climate and how these systems can be impacted by shifts in temperature, precipitation, and other aspects of climate. Through the assessment process, climate impacts are analyzed and described based on the best-available science to inform management activities about the positives and negatives likely to occur in the short- and long-term. The assessment identifies and promotes best practices for adaption and mitigation, and it is a tool to build public awareness and understanding of climate change. Likewise, the assessment can build partnerships with local, State, and Federal stakeholders and partners, which are vital to enhancing community resilience.

## VII. Conclusion

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This Implementation Plan recommends various strategies and tools for mitigation and to address the hazards identified and detailed in the Lower Boise Watershed Risk Report. Adopting these recommendations can play a significant role in reducing risks and vulnerability, and increase overall watershed and community resilience to natural hazards. The recommendations put forth cover a wide range of strategies and tools, with some requiring extensive time and resources and others requiring minimal time and efforts to implement. Taken cohesively, the implementation strategies and tools provide a foundation on which the communities of the Lower Boise Watershed can build sound mitigation strategies.

There are many opportunities for these communities to partner with neighboring communities and agencies across administrative lines. The ultimate recommendation of this Implementation Plan is a meeting of the listed communities to facilitate discussion of the results of the Lower Boise Risk Report and the Lower Boise Watershed Implementation Plan. Collaboration across boundary lines opens up additional aid and resources that can greatly benefit all communities and their populations. Through this meeting and other discourse, the Lower Boise Watershed can act at both a regional and local level to determine the strategies that are most effective, most efficient, and best fit the populations and communities within the watershed.

After local community officials meet and discuss the two reports, each community can then present these strategies to the general public within their individual communities. Ideally, these strategies should be discussed in smaller public focus groups to best maintain each community's desired conditions. After each community holds these focus groups, a multi-jurisdictional public focus group can be held to discuss the issues at the watershed level. Through this process, a comprehensive, holistic, and sound mitigation strategy can be drafted and implemented to make the Lower Boise Watershed resilient against future losses from hazards.



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## IX. Appendices

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### Acronyms and Definitions

Below are the various acronyms and their meanings used throughout the Risk Report:

AOMI	Areas of Mitigation Interest
BFE	Base Flood Elevation
CRS	Community Rating System
DMA	Disaster Mitigation Act of 2000
FBC	Form Based Code
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
GIS	Geographic Information System
GMA	Growth Management Act (GMA)
GWSERV	Geographically-Weighted Spatially Explicit Resilience-Vulnerability
HazCIRC	Hazards & Climate Impacts Research Center
HMP	Hazard Mitigation Plan
IBC	2012 International Building Code
ID	Idaho
IRC	2012 International Building Code
IWUIC	2012 International Residential Code
LFD	Letter of Final Determination
LLUPA	Local Land Use Planning Act
NFIP	National Flood Insurance Program
PDRP	Post-Disaster Recovery Plan
PUD	A Planned Unit Development
Risk MAP	Risk Mapping, Assessment and Planning
SERV	Spatially Explicit Resilience-Vulnerability
TDR	Transfer of Development Rights

UDF	User-Defined Facilities
USGS	United States Geological Survey
WUI	Wildland-Urban Interface