

13.1 Introduction

This plan is an update of the 2004 City of Redmond Hazard Mitigation Plan (HMP). Although it is an update, this document has been redesigned so that it looks, feels, and reads differently than the original. This is due to several factors: new hazard information has become available that drives new definitions of risk, the City has matured and new capabilities are now available, and the new format will allow readers to more easily understand the content. In addition, the 2004 HMP included several action items that have been completed, creating an opportunity for developing new mitigation strategies.

FEMA requires that a Mitigation Strategy section be included to insure that the hazard mitigation plan “provides the jurisdiction’s blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.”¹⁴⁰ The 2009 Redmond Hazards Mitigation Plan Update strategies outlined below describe the tools the City will use in order to better mitigate the impacts of hazardous events.

The Project Team created strategies and action items to achieve the hazards mitigation goals of Redmond’s Hazards Mitigation Plan and Comprehensive Plan. The strategies and action items were developed by analyzing the most probable scenarios (See Part 3). The scenarios were chosen in a process that included consultation with Redmond City staff and a prioritization of hazards based on their frequency, severity, and impacts on the natural environment, local systems, the built environment, and vulnerable populations.

Through this process, the Project Team analyzed hundreds of strategies as possible mitigation efforts for the selected scenarios. These strategies were analyzed using input from the public participation meeting, online questionnaire results, and additional meetings with City staff. Consideration of outstanding action items from previous hazards mitigation plans were also considered to create a robust suite of strategies. As part of this narrowing process, a benefit-cost analysis was completed on every action item. Through this analysis, strategies and action items were chosen to best reflect the hazards mitigation needs and opportunities for the City. The action items, including responsible departments and potential financing mechanisms, are provided in detail below.

Mitigation Strategy FEMA Requirements

Requirement §201.6(c)(3): (c) Plan content. The plan shall include the following: (3) A mitigation strategy that provides the jurisdiction’s blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This section shall include:

- (i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
- (ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
- (iii) An action plan describing how the actions identified in paragraph (c)(2) (ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

¹⁴⁰ Title 44 §201.6(c)(3), of the Code of Federal Regulations, Chapter 1 Federal Emergency Management Agency, Department of Homeland Security, Part 201 Mitigation Planning, <http://frwebgate.access.gpo.gov/cgi-bin/get-cfr.cgi>.

13.2 Goals

The goals provided by the Redmond Comprehensive Plan and previous Hazards Mitigation Plan were used to determine the overarching hazard mitigation goals for the 2009 update. The goals, listed below, emphasize protection of the environment, the importance of parks and public facilities, resilient transportation options, and a focus on the importance of the Downtown and Overlake areas. With this in mind, strategies that supported these community desires were weighted more heavily in the selection process. In many cases, a natural overlap existed. For example, having multimodal transportation options contributes to the Comprehensive Plan's desired high quality of life as well as providing important redundancy in the face of hazards risk.

The Redmond Comprehensive Plan goals

1. To conserve agricultural lands and rural areas, and to protect and enhance the quality of the natural environment.
2. To retain and enhance Redmond's distinctive character and high quality of life, including an abundance of parks, open space, good schools and recreational facilities.
3. To emphasize choices in housing, transportation, stores and services.
4. To support vibrant concentrations of retail, office, service, residential, and recreational activity in Downtown and Overlake.
5. To maintain a strong and diverse economy and to provide a business climate that retains and attracts locally owned companies as well as internationally recognized corporations.
6. To promote a variety of community gathering places and diverse cultural opportunities.
7. To provide convenient, safe and environmentally-friendly transportation connections within Redmond, and between Redmond and other communities for people and goods.
8. To remain a community of good neighbors, working together and with others in the region to implement a common vision for Redmond's future.

The 2004 Hazards Mitigation Plan outlines the following goals

1. Increase community resiliency to large scale regional events (including local government infrastructure, critical facilities, and lifelines)
2. Reduce vulnerability of single-family homes
3. Reduce vulnerability of small businesses
4. Reduce vulnerability of large corporations
5. Reduce potential for isolation-disrupted lifelines and infrastructure
6. Reduce exposure to high-risk facilities and utilities (including local government infrastructure, critical facilities, and lifelines)
7. Preserve and enhance the natural environment
8. Reduce vulnerability of historic and cultural resources
9. Create recovery plan for Redmond historic district

13.3 2009 Strategies

Combining the Redmond Comprehensive Plan Goals and unattained goals from the 2004 Hazards Mitigation Plan, we have designed the following strategies for Redmond's 2009 Hazards Mitigation Plan update. This plan recognizes that hazard events are unavoidable. Given the distribution of vulnerabilities across the City and the potential magnitude of events, parts of Redmond will be isolated. Therefore, the strategies outlined in this section are intended to simultaneously increase the self-sufficiency of Redmond's residents and strengthen City resiliency to minimize the duration of that isolation. The strategies are as follows:

Strategy 1

To mitigate impacts involved with isolation following a severe hazard event, Redmond will develop outreach activities to enable Redmond residents, businesses and visitors to survive in-place for more than three days.

Strategy 2

To ensure provision of vital services following a hazard event, Redmond will develop alternative service centers in less hazardous areas.

Strategy 3

To mitigate damage to vulnerable structures and infrastructure, Redmond will promote retrofitting with safe-to-fail mechanisms.

Strategy 4

To mitigate against the loss of major transportation facilities in and around the City, Redmond will invest resources in building more resilient transportation networks.

Strategy 5

To mitigate against the functional loss of business communities, Redmond will develop and deliver business outreach programs.

Strategy 6

To mitigate impacts from expected increases in incidences of shallow flooding, Redmond will build a flood tolerant community able to accommodate increases in low impact flooding

These strategies and the action items necessary for their implementation, along with the methodology by which they were derived, are discussed in detail in the next section.

13.4 Benefit-Cost Analysis

After identifying strategies, the Project Team completed a benefit-cost analysis approximating the costs and benefits associated with each action item. The criterion used to evaluate each item was based on a classification of high, medium, or low for benefit and cost. This process provided financial analysis that contributed to the decision of which action items to include in the final plan.

To approximate benefit, the savings in future expected damage considered the following:

- Frequency of the hazardous event
- Longevity of the benefit
- Discounted present value of future benefits¹⁴¹

Per FEMA requirements, the estimation of benefits did not include the value of human lives or cultural values. However, these items were considered when selecting final action items to include in the plan.

To approximate benefit:

1. **Low** = Less than 1 million dollars in damage prevented
2. **Medium** = Between 1 and 10 million dollars of damage prevented
3. **High** = More than 10 million dollars of damage prevented

To approximate cost:

1. **Low** = Within Redmond's existing budget
2. **Medium** = Less than 1 million dollars in additional funds required
3. **High** = More than 1 million dollars in additional funds required

Action items that provided a Medium or High net benefit and supported the strategies were favored for inclusion in the plan. Items were then reevaluated considering non-monetary values such as health and safety, human lives saved, cultural values, and political feasibility to determine the final list.

See Appendix B for the results of the full benefit-cost analysis. Appendix B is divided into four sections: action items included in the plan, action items that address hazards currently regulated or monitored by external agencies, action items that

¹⁴¹ A seven percent (7%) discount rate was used on future value for this benefit-cost analysis. This is consistent with FEMA's requirement, (Appendix C: DMA 2000 Job Aid C.3 ESMP ii. §201.5[b][2]) to use values in accordance with the Office of Management of Budget (OMB) Circular A-94, <http://www.whitehouse.gov/omb/circulars/a094/a094.html#8>.

regard emerging hazards that may be more appropriate in the next HMP update, and action items that were discarded for one or more reasons (e.g. not financially viable).

13.5 Selected Strategies and Action Items

Strategy 1
To mitigate impacts involved with isolation following a severe hazard event, Redmond will develop outreach activities to enable Redmond residents, businesses and visitors to survive in-place for more than three days.

Hazards Addressed by this Strategy								
Severe Storms	Earthquakes	Floods	Wildfires	Landslides	Pandemics	Heat Waves	Drought	Hazardous Materials
x	X	X	X	X	X	X	X	X

Risks Addressed by Strategy 1

There are ten neighborhoods in Redmond. Three sets of neighborhoods are located on distinct hills, or are separated by the alluvial, liquefiable Bear Creek and Sammamish River valley floors. The remaining area is located on the flat river valley. Severe winter storms limit access to hill communities (see Chapter 4 and **Map 2** for specific locations). Flooding events would make traversing the valley floor difficult.

A Crustal Earthquake along the South Whidbey Island Fault to the north or the Seattle Fault to the south will interrupt accessibility. There will be damage to both access roads crossing the valleys and major arterials servicing Redmond as a whole. Either of these hazard events will isolate residential and business communities for many days.

Hill communities include:

- Education Hill and North Redmond (Residential)
- Overlake, Willows and Grasslawn (Mixed uses within Overlake Community)
- Southeast Redmond (higher neighborhoods) (Mixed uses)

Valley floor communities include:

- Sammamish Valley (Mixed use)
- Downtown (Mixed use)
- Bear Creek (Mixed use)
- Southeast Redmond (lower neighborhoods) (Mixed use)

The Redmond Comprehensive Plan includes a goal to emphasize choices in housing and transportation. The geographic variety creates a context in which subpopulations are at risk of short-term isolation during a major hazard event. Many people can manage this type of isolation with only minor enhancements to current supplies and

preparations.

The City of Redmond will support opportunities that prepare individuals and communities for isolation through the development or enhancement of outreach activities that build upon existing mutual aid systems. Outreach efforts should leverage information technologies, such as the City's website, and direct contact through community organizations, such as schools, businesses, and faith communities. Some educational materials should be community specific. The City should provide information on the following topics in several of the most commonly spoken languages:

- Locating and shutting off home and business utility services
- Testing for contamination of private well water
- Installation of sump pumps or other flood mitigation technologies
- Proper storage of home hazardous materials
- Designated channels and alternative techniques for emergency communications
- Building material upgrades for withstanding extreme weather and other hazard conditions

Further in line with Redmond's desire to afford all residents housing choices, the Community Emergency Response Teams (CERT), Map Your Neighborhood programs and Block Watch should be expanded with a focus on serving neighborhoods with vulnerable populations.

The Redmond Comprehensive Plan also includes goals to create a community of supportive good neighbors while promoting a variety of gathering places and cultural opportunities. It is likely that subpopulations will find themselves isolated from the general public immediately after an event. A properly implemented response plan can provide a small community with the resources necessary to manage being cut off from the rest of the City.

A primary aspect of this strategy is also the identification of potential safe locations, such as parks, open spaces, schools, homes, or faith communities that are accessible by foot and capable of providing basic necessities. Along with stocking safe locations with resources for human needs – food, water, first aid, and medical facilities – these locations should have, or be fitted with, kitchen facilities and emergency power generating equipment. Multiple routes to designated areas should be established with clear, easily understood signage. Finally, as Redmond moves forward with new planning and development, it should encourage mixed-uses as much as possible. Neighborhoods that provide a variety of services will be able to better accommodate residents in the case of extended temporary isolation.

	Action Items	Lead Agencies	Other Agencies/ Partners	Funding
1-1	Develop an enhanced neighborhood based outreach program to better prepare visitors, residents and business owners to be isolated from expected services for extended periods (over 3 days). Program will be built on three successful programs. Map-your-neighborhood Block Watch CERT	Emergency Management	Fire Department Police Department Faith based partners	Redmond Operating Budget
1-2	Initiate a discussion of amending Comprehensive Plan to allow mixed uses within communities that may be isolated	Planning Department	Emergency Management	Redmond Operating Budget
1-3	Identify communities that would be isolated during a probable event, their available private and public services and existing mutual aid systems.	Planning Department		Redmond Operating Budget
1-4	Work with community to identify, implement and promote safe locations that will stock basic human needs.	Emergency Management	King County Public Health, School District, Houses of Worship, Community Groups	Redmond Operating Budget
1-5	Identify and create parks trail and open spaces for meeting places following hazards events.	Parks and Recreation	Emergency Management, School District	Redmond Operating Budget

Table 19: Action Items for Strategy 1

Strategy 2

To ensure provision of vital services following a hazard event, Redmond will develop alternative service centers in less hazardous areas.

Hazards Addressed by this Strategy

Severe Storms	Earthquakes	Floods	Wildfires	Landslides	Pandemics	Heat Waves	Drought	Hazardous Materials
x	x	x	x	x	x	x	x	x

Risks Addressed by Strategy 2

The Redmond built environment includes three hill communities (see neighborhood listing above) and several built on the valley floor. While each community is threatened by different risks, the varied topography and neighborhood characteristics provide resiliency opportunities.

The Overlake neighborhood is a mixed-use neighborhood located on the southern side of the City, furthest from the South Whidbey Island fault. It is located on soils less vulnerable to ground shaking, off the floodplain. The neighborhood has the greatest exposure to a Seattle Fault event.

The **Education Hill** neighborhood is located to the north of Downtown closer to the South Whidbey Island Fault escarpments, but farther from the Seattle Fault. It is also off the floodplain. The City of Redmond is currently designing Fire Station 17; the location of this station is outside of the liquefaction zone for a quake along the Seattle Fault. An alternate emergency operation and command center has been proposed for Station 17 to harden the City's response capabilities in the event of a Seattle Fault earthquake.

The valley communities (including the neighborhoods of **Sammamish Valley, Downtown, Southeast Redmond** and **Bear Creek**) are relatively equally vulnerable to earthquake events along either fault. These communities are also vulnerable to severe flooding. Despite the liquefaction and flooding threats, the large, flat valley topography has remained accessible during historical heavy snow conditions and following Benioff earthquakes with distant epicenters. There are many services available in the valley communities. The majority of Redmond's commercial and retail establishments, City Hall, a major community center, Fire and Police headquarters are located within these neighborhoods.

The Redmond Comprehensive Plan includes a goal to support the vitality of both the Downtown and Overlake areas through concentrations of business, residential, and recreational activities in both areas. Aligned with this idea of multiple community cores, this strategy envisions locating redundant, vital City services in two or three of the following distinct areas of the City:

- Overlake commercial area
- Education Hill – Fire Station 17
- Downtown Emergency Operation Center (EOC)

The current placement of first responders and City operations centers within earthquake liquefaction areas and flood hazards zone will restrict capabilities under probable scenarios. A large-scale earthquake that causes severe damage to business and residential interests throughout Redmond could also completely disable existing emergency response and recovery capabilities. Alternative capabilities do not currently exist.

	Action Items	Lead Agencies	Other Agencies/ Partners	Funding
2-1	Develop alternative redundant services off floodprone, liquefiable lands.	Planning Department	Public Works Emergency Management Fire Department	Redmond Operating Budget Funds will have to be sought to develop Fire Station 17 and an Overlake facility.
2-2	Until alternative sites can be developed, continue partnership with Microsoft. Develop new City command center(s) away from downtown liquefaction and flood zones.	Emergency Management	Public Works, Fire Department, Police Department, Microsoft	GMA fund requests via Comprehensive Plan Updates
2-3	Integrate the HMP goal of creating decentralized centers into the comprehensive plan to provide further support for existing policies supporting multiple centers and consider hazards in general planning decisions	Planning Department		Redmond Operating Budget

Table 20: Action Items for Strategy 2

Strategy 3

To mitigate damage to vulnerable structures and infrastructure, Redmond will promote retrofitting with safe-to-fail mechanisms.

Hazards Addressed by this Strategy

Severe Storms	Earthquakes	Floods	Wildfires	Landslides	Pandemics	Heat Waves	Drought	Hazardous Materials
x	x	x		x				

Risks Addressed by Strategy 3

The Redmond built environment is among the newest of the Seattle metropolitan communities. Most infrastructure and buildings were built in compliance to rigorous earthquake and national flood insurance codes and ordinances with the exception of:

- Unreinforced Buildings
- Homes built before 1970 that predate the International Building Code earthquake and National Flood Insurance regulations

Securing utility lines and facilities to avoid secondary hazards such as power outages or fire is an important aspect of mitigating hazard damage. Retrofitting structures and equipment can be a cost effective way to mitigate damage to the built environment.

	Action Items	Lead Agencies	Other Agencies/ Partners	Funding
3-1	Provide incentives for seismic retrofitting of historic buildings, including tax credits, low interest revolving loans, code compliance, grants, and/or municipal bonds.	Planning Department	Public Works Emergency Management	Grants, Loans, National Register, Community Development Block Grant
3-2	Create an inventory of susceptible buildings, culverts, roads and other critical utilities. Use inventory to prioritize retrofits of City assets.	Public Works	Puget Sound Energy	Puget Sound Energy
3-3	Locate emergency response and operation centers north, in Fire Station 17 and south of Downtown in the Overlake neighborhood. Once appropriate facilities have been determined they should be retrofitted, if necessary, to withstand severe ground shaking.	Planning Department	Emergency Management	FEMA Grants

Table 21: Action Items for Strategy 3

Strategy 4

To mitigate against the loss of major transportation facilities in and around the City, Redmond will invest resources in building more resilient transportation networks.

Hazards Addressed by this Strategy								
Severe Storms	Earthquakes	Floods	Wildfires	Landslides	Pandemics	Heat Waves	Drought	Hazardous Materials
x	x	x	x	x				x

Risks Addressed by Strategy 4

The loss of functional transportation systems cannot be avoided in the scenarios driving this Mitigation Plan. Due to this, it is important that the City reinforce connections to service centers with hardened infrastructure and alternate multi-modal routes.

Connections between service centers under consideration include:

- Southern Center -- Overlake neighborhood
- Central Center -- City Hall and City ECC
- Northern Center -- Fire Station 17

Establishing an emergency conditions roadway management plan would mitigate the impacts of hazards to current roadways. Providing these hardened and alternative transportation facilities will provide better access to and from emergency service centers. This is particularly important given the absence of major medical facilities within City limits.

Another key part of this strategy is the provision of a comprehensive non-motorized trail network that can facilitate travel when traditional roads are not usable. This relates closely with Comprehensive Plan goals pertaining to open space and recreational opportunities, as well as Hazards Mitigation Plan goals to decrease vulnerabilities and minimize isolation. For example, the Sammamish River Trail can serve as secondary route to transport emergency supplies when traditional routes are impassable.

Along with an emergency conditions roadway management plan, design guidelines can help mitigate impacts to transportation networks. Guidelines could use incentives such as density and height bonuses, as well as departures from zoning requirements, to achieve hazard mitigating urban design. Examples of hazard sensitive urban design include designing plazas at key intersections to reduce the vulnerability to street blockage from fallen structures and trees. This would involve establishing a policy that considers building clearance in the redevelopment of streets within Downtown, Overlake and routes servicing the Fire Station 17.

	Action Items	Lead Agencies	Other Agencies/ Partners	Funding
4-1	Harden multi-modal connections between Downtown and Overlake to provide access to protected emergency centers.	Public Works	Planning Department, Metro	Parks District, Safe Routes to School
4-2	Develop bicycle and pedestrian network that can serve as secondary route to transport emergency supplies.	Public Works	Parks and Recreation	Parks District, Safe Routes to School
4-3	Develop an emergency conditions roadway management plan. The plan will address installing traffic signals not reliant on the power grid, preemptively applying de-icer to roads and sidewalks at the time of major storm warnings, prioritize street clearing by key access points and community vulnerability (not road hierarchy), and other relevant issues.	Public Works	Emergency Response	Safe Routes to School, Federal grants
4-4	Modify design guidelines to promote incorporation of hazard sensitive urban design.	Planning Department		Federal grants

Table 22: Action Items for Strategy 4

Strategy 5

To mitigate against the functional loss of business communities, Redmond will develop and deliver business outreach programs.

Hazards Addressed by this Strategy

Severe Storms	Earthquakes	Floods	Wildfires	Landslides	Pandemics	Heat Waves	Drought	Hazardous Materials
x	x	x	x	x	x	x	x	x

Risks Addressed by Strategy 5

Redmond is home to several major corporations, including Microsoft, Nintendo and Genie Industries. These corporations have vendor relationships with many local small businesses. The systemic interdependencies among these business networks are as vulnerable to significant earthquakes and winter storms as is the physical built environment.

Small businesses are located throughout Redmond within existing commercial centers and from home-based operations located within residential neighborhoods.

	Action Items	Lead Agencies	Other Agencies/ Partners	Funding
5-1	Develop a specific outreach program promoting existing contingency planning tools available through the Washington EMD Business Portal	Emergency Management	Planning department, Faith-based organizations, Chamber of Commerce	City Operating Budget
5-2	Encourage businesses to partner, thereby sharing resources and risks (e.g. cold storage, alternative power).	Emergency Management	Planning department, Faith-based organizations, Chamber of Commerce	City Operating Budget

Table 23: Action Items for Strategy 5

Strategy 6

To mitigate impacts from expected increases in incidences of shallow flooding, Redmond will build a flood tolerant community able to accommodate increases in low impact flooding

Hazards Addressed by this Strategy								
Severe Storms	Earthquakes	Floods	Wildfires	Landslides	Pandemics	Heat Waves	Drought	Hazardous Materials
x		x	x	x	x	x	x	

Risks Addressed by Strategy 6

As stated in the City of Redmond final draft of the 2009 draft Comprehensive Flood Hazard Management Plan:

“because of the flood modifications to the Sammamish River channel made by the U.S. Army Corps of Engineers (USACE), the current impacts of flooding within the City of Redmond (City) pose little risk to public safety and relatively low risk to existing public and private development...however Redmond, faces the potential for an increase in flood hazard risks as a result of the tremendous population and development growth within the watersheds and the expected loss of key floodplain functions.”

Generalized flooding is not a current problem; however, climate change was not addressed in the 2009 Final Draft Comprehensive Flood Hazard Management Plan and projected changes in rainfall frequency and intensity, along with increased in upstream development, create a more problematic flood scenario.

Climate models for the region forecast increases in winter rainfall intensity, duration and frequency resulting in increasing shallow valley floor flooding. Summers will be drier. Winter flooding will become more frequent as the watershed built environment becomes increasingly impermeable. The low gradient of valley rivers will not provide the energy to discharge surface water quickly and ponding will occur throughout the Downtown, Sammamish Valley, Bear Creek and SE Redmond neighborhoods. With the valley floor being extremely permeable, sub-surface interflow processes will have a greater effect in removing ponding water than will surface drainages.

A secondary risk resulting from surface flooding will be from pollutants stored in garages and stores contaminating shallow aquifers and contaminating wells.

This Hazards Mitigation Plan incorporates the goals, principles and recommendation of City of Redmond Final Draft Comprehensive Flood Hazard Management Plan and its emphasis on stormwater and habitat management specifically to:

1. Prevent the loss of life, creation of public health or safety problems, and damage to public and private property from floods.
2. Maintain the varied uses of existing drainage pathways and floodplains within the City.
3. Minimize pollution hazards to surface and groundwater during flood events.
4. Promote watershed-based flood management strategies that balance engineering, economic, environmental, and social factors.
5. Restore properly functioning conditions for degraded floodplains.
6. Coordinate flood hazard planning and management with interested and affected parties in both public and private sectors.
7. Increase the public understanding of flood hazard issues.
8. Promote a comprehensive understanding of Redmond's floodplains and flood hazards.
9. Promote a stable, adequate, and publicly acceptable long-term source of financing flood hazard management work.
10. Reduce the long-term costs of flood hazard management.
11. Maintain an updated and accurate plan over time.

The Hazards Mitigation Plan differs from the Flood Hazard Management Plan in that it focuses on less frequent events that have a higher probable impact. Increases in watershed impermeability and global warming will increase the likelihood, albeit infrequent, of extensive shallow valley floor flooding. The probable flooding will not have an adverse impact if developments are made to be safe to fail. If pollutants are kept from entering the groundwater and homes are built above the base flood elevation (factoring future development and climate conditions), flooding will have a minimal adverse impact while preserving the natural beneficial floodplain processes.

In adapting to climate change the City and its residents should expect that in rare, though increasingly probable, flood events, shallow water will cover the land and understand that this flooding is both appropriate and beneficial.

The following steps can be taken to minimize the adverse impacts of flooding:

1. Simultaneously protecting existing development from flood and protecting ground water from harmful chemicals through localized ring dikes and berms.
2. Accommodating flooding through structure elevation and wet floodproofing.
3. Retreating off the floodplain where alternative sites are practicable.

Each of these strategies is mentioned in the draft Flood Hazards Management Plan. Not mentioned in that plan, or action items that should receive greater emphasis, include:

	Action Items	Lead Agencies	Other Agencies/ Partners	Funding
6-1	Monitoring localized climate change impacts.	Surface Water Management	Planning department	City Operating Budget
6-2	Performing hydrologic and hydraulic analyses that factor in climate change scenarios as well as future land use.	Surface Water Management	Planning department	Stormwater Utility Fund
6-3	Add flood storage lands to floodplain delineations that accommodate climate change scenarios and identify impacts. This may result in amending the Flood Hazards Management Plan.	Surface Water Management	Planning department	Stormwater Utility Fund
6-4	Promote a discussion of the beneficial impacts of flooding within valley communities	Surface Water Management	Planning Department, Parks Department, Board of Education	Stormwater Utility Fund

Table 24: Action Items for Strategy 6