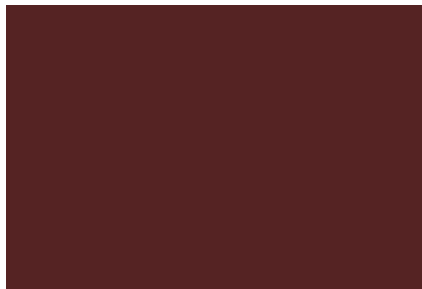
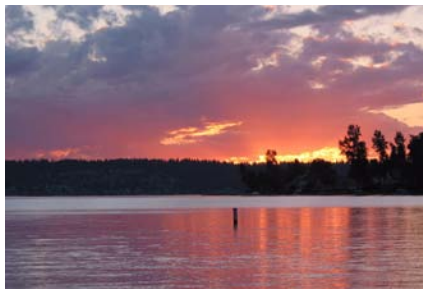


HAZARDS MITIGATION PLAN UPDATE





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COLLEGE OF BUILT ENVIRONMENTS
UNIVERSITY OF WASHINGTON

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Executive Summary

This Hazards Mitigation Plan (HMP) Update focuses on long-term improvement and protection of the built and natural environments, infrastructure, communication networks and the livelihood of the City of Redmond. This plan strives to reduce the financial impacts resulting from hazards and create a community more resilient to inevitable hazards.

Through a hazards assessment process, the project team identified hazards that pose a significant threat to Redmond, those that pose a less significant threat, and those that are emerging threats. Severe storms and earthquakes pose the greatest threat to Redmond. Severe storms are expected to increase in frequency and severity as the Northwest becomes more affected by Climate Change. Earthquakes occur infrequently, but the potential devastation of Benioff, Crustal and Subduction earthquakes make this hazard a significant concern.

This 2009 HMP Update builds on the 2004 HMP, with new attention paid to the impacts of Climate Change. Recent studies, recognized by both the state and federal governments, indicate that the weather in the Northwest will be more severe than historical trends, exacerbating current threats and creating new areas of concern.

The project team took a comprehensive approach to develop mitigation strategies. Through a review of the current state of the community, a public process, working with the Mitigation Implementation Committee, and reviewing existing plans, the team developed a set of strategies to minimize the potential impacts of hazards in Redmond. A detailed list of action items supports the following strategies:

- 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.*
- 2. To ensure provision of vital services following a hazard event, Redmond will develop alternative service centers in less hazardous areas.*
- 3. To mitigate damage to vulnerable structures and infrastructure, Redmond will promote retrofitting with safe-to-fail mechanisms.*
- 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.*
- 5. To mitigate against the functional loss of business communities, Redmond will develop and deliver business outreach programs.*
- 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.*

How to Use This Plan

The 2000 Stafford Act, also known as the Disaster Mitigation Act (DMA) of 2000 (Public Law 106-390), made Hazards Mitigation Planning mandatory. Prior to 2000, Federal grant programs existed to provide funds for disaster relief, recovery, and to some extent hazards mitigation planning, but municipalities were not obligated to submit mitigation plans. The DMA strengthened federal legislation by emphasizing mitigation actions and promoting pre-disaster planning.

According to FEMA, “mitigation is the effort to reduce loss of life and property by lessening the impact of disasters.”¹ Mitigation includes both structural and non-structural solutions. For example, city codes that prohibit new development in floodplains, community education programs and retrofitting old buildings are all encompassed in mitigation. The City of Redmond Hazards Mitigation Plan (HMP) identifies and outlines strategies to reduce potential impacts of natural hazards. Implementation of the plan will increase public safety and minimize recovery costs.

The HMP is one part of emergency management. Mitigation refers to the actions designed to decrease the impact of an event. The other three elements of emergency management are preparedness, response and recovery. Those phases are addressed in separate, but correlated plans.

This new plan expands upon existing work and information gathered by the City of Redmond’s 2004 HMP and 2006 plan update. The HMP serves as a basis for city-level emergency management planning and programming. It helps local businesses, community services, and school districts develop similar documents and coordinate overall disaster mitigation planning efforts. This document is an important first step toward making the City of Redmond more resilient to natural disasters.

This HMP identifies nine hazards that pose a threat to the City of Redmond. Mitigation efforts are considered for the following hazards:

- Severe Storms
- Earthquakes
- Floods
- Fire
- Landslides
- Pandemics
- Heat Waves
- Drought
- Hazardous Materials

This HMP defines each hazard, assesses the risk to the City of Redmond, and provides long-term mitigation strategies. The primary users of the document will be the City of Redmond Planning Department, Emergency Management, and Emergency Services.

¹ FEMA, “FEMA: Mitigation,” <http://www.fema.gov/government/mitigation.shtm#1>.

The document contains information relevant to other departments, including Public Works, the Parks Department, Information Systems GIS Division, and Financial Services. The HMP will be publically available.

Plan Organization

This HMP is organized into five parts and 14 chapters that follow the phases of the plan's development as follows:

- Part 1 - Introduction and Community Profile
- Part 2 - The Planning Process
- Part 3 - Hazard Identification and Risk Assessment
- Part 4 - Mitigation Strategies
- Part 5 - Plan Maintenance

Supporting documentation, maps, tables, and public participation instruments are included throughout the document and/or in the appendices.

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1.1 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.

There is a variety of hazards that pose risks to people and property in Redmond. A hazards event becomes a disaster if vulnerabilities are high and capabilities insufficient. The extent of destruction resulting from an event is determined by the degree to which vulnerabilities cannot be protected. Redmond is at risk of both natural hazards, such as earthquakes, and human caused events, such as a hazardous material spill. In both cases, damages can be exacerbated by alterations to the natural environment.

This HMP focuses on long-term improvement and protection of the built and natural environments, infrastructure, communication and the livelihood of the community. This plan strives to reduce the financial impacts and make the community more resilient to inevitable hazards.

This HMP identifies the hazards that pose the greatest risk to the City of Redmond. The risk assessment section examines the four factors of risk: location, timing and duration, severity, and frequency. The results of this risk assessment serve as a basis to determine which hazards demand the most attention in this plan. Hazard specific vulnerabilities are addressed in Part 3, Risk Assessments.

This plan includes several hazards-related scenarios to help readers conceptualize a hazards event. The scenarios include probable secondary hazards. Through critical analyses and public input, this plan concludes with a set of long-term strategies and action items that call for more immediate attention.

1.2 Objectives, Strategies and Action items: 2004, 2006, 2009

Based on the goals of Redmond's Comprehensive Plan, the Project Team designed the following objectives, strategies and action items for Redmond's 2009 Hazards Mitigation Plan. This plan recognizes that hazardous events are unavoidable. Given the distribution of vulnerabilities across the City and the potential magnitude of hazardous events, parts of Redmond may experience isolation. Therefore, the strategies outlined in this section are intended to both increase the self-sufficiency of Redmond residents and to increase the City's resiliency to minimize the duration of that isolation. The strategies revolve around the following concepts:

- Survival education for isolated individuals
- Robust emergency services
- Neighborhood isolation from utilities and infrastructure
- Retrofit of utilities
- Retrofit of historic building stock
- Reinforcement of transportation facilities and diversity modal alternatives

For a complete list of 2009 objectives, strategies, and action items related to strategies above, please refer to Part 4, Chapter 13, Mitigation Strategy.

Tables 1 and 2 list action items from 2004-2006 and the current status. The progression of topics, specificity and tone from 2004 to present indicates shifting levels of concerns residents place on potential hazards. Issues that are framing the 2009 update include:

- Disabled transportation networks during the 2008 winter storms
- A one-week power outage in mid-December of 2006 that resulted from the “Hanukkah Eve Wind Storm”
- Hurricane Katrina of 2005 and resulting reforms to FEMA guidelines

2006 Action Items and Current Status		
Rank	Top 10 action items	Current status
1	Identify alternative emergency government operations capability outside of high-risk areas	Ongoing: Very few permanent facilities set up.
2	Partner with King County, neighboring jurisdictions, and WSDOT to harden transportation routes	Complete: Routes hardened within Redmond. City staff is on three regional committees.
3	Strengthen relationships between corporations and vendors, including provisions for Emergency Operations Centers and mutual aid.	Ongoing
4	Reduce risk to the Olympic Pipeline and surrounding areas	Complete: No other politically acceptable options at this time.
5	Implement neighborhood-targeted risk reduction programs	Ongoing
6	Design events promoting business continuity	Ongoing
7	Adopt a Post-Disaster Recovery Plan for Old Town	No change. See #8 for further details.
8	Retrofit historic downtown structures	Ongoing
9	Support regional mitigation initiatives	Completed
10	Enhance existing GIS capabilities emphasizing hazard analysis	No change

Table 1: 2006 Action Items and Current Status

Table 2 presents a review of the update of 2004 Action Items list, as included in the 2006 Hazards Mitigation Plan Update.

2004 Action Items and Current Status			
Rank	Activity	Description of Activity	Status
1	Development of Wellhead Protection Ordinance	Study of Redmond aquifers and sensitive areas. Development of regulations for protection of city wells and aquifers.	Complete
2	Wellhead 4 Redevelopment	Move Wellhead #4 200 feet east and re-drill. Project designed to guarantee water in the future.	Complete
3	Redevelopment of Wellheads 1, 2, & 3	Retrofitting of wells designed to guarantee water in the future.	Complete
4	Community Awareness Activities	Public education, presentations, support of Community Organizations Active in Disaster, Citizen Corps, and AmeriCorps. Support of countywide regional mitigation efforts.	Ongoing
5	Olympic Pipeline Setback Plan	Participation in development of plans and guidelines for the plan and City ordinance and Development Guide.	Complete
6	Earthquake Strapping	Tie-down of computer and communications equipment (Non-structural mitigation)	Pilot Program In Place
7	Generator Retrofit for the Public Safety Building	Increase emergency capacity from 50% to 100% in the Public Safety Building and Emergency Operations Center. Rerouted exhaust system for safety purposes.	Complete
8	Alternate EOC and Command Post capabilities	Purchased a Mobile Command Unit and installed communication equipment. Set up power and communication connections at strategic locations for alternate emergency operations centers.	Complete
9	Upgraded GIS Capabilities and Distributed Database	Hours assigned to Emergency Management and Hazards Mitigation, Risk Mapping from Management Information Services Division. GIS and distributed database capabilities added to the Emergency Operations Center as a virtual network.	Ongoing
10	Development of Central Receiving	Reduction of terrorism risk through the central processing of mail and packages in a secure location.	Awaiting Funding

Table 2: 2004 Action Items and Current Status

1.3 Strengths, Weaknesses, Opportunities and Threats (SWOT)

A SWOT analysis was undertaken to clarify the physical, regional, political and economic factors that influence Redmond’s vulnerabilities and capabilities.

1.3.1 Strengths

Redmond is well positioned in regional politics with staff members on three different regional councils. Redmond was largely developed after the 1963 construction of the Evergreen Point floating bridge; consequently, the majority of the buildings were erected within the past 50 years. Despite the recent economic downturn, the local economy remains strong.

Although the valley and hill terrain in Redmond creates areas that are vulnerable

to each of the probable hazards, the variation in landscape increases the possibility that damage will be localized. In the event of any hazard, some of the neighborhoods will be less affected than others.

1.3.2 Weaknesses

The Downtown neighborhood and most of Redmond's emergency services are located within the valley, where the liquefaction and flood zones overlap. The Old Town area (with the highest concentration on unreinforced masonry buildings) is also located on these liquefiable, flood prone soils. Despite these factors, Redmond is currently focusing economic redevelopment and increasing residential density in this area. Furthermore, the valley separates the several neighborhoods located on the hills. Although the hill neighborhoods may be unaffected by flooding or an earthquake, isolation may result from network disruptions in the lowlands.

1.3.3 Opportunities

The next earthquake will likely destroy some of the older, non-historic buildings that were constructed prior to the adoption of the International Building Code. This will create an opportunity for new businesses to develop the area with lower demolition costs, leading to the urban revitalization of Redmond's Old Downtown.

Recent winter storms highlight the fact that hazards events cause isolation. This understanding can be used as a catalyst to increase development of pedestrian pathways, open green space, and mixed-use neighborhoods. Pedestrian pathways and diversified land use can provide alternative emergency transportation routes and create staging areas for emergency service provision.

1.3.4 Threats

Economic disruption in the event of a hazard is a major concern for the City of Redmond. Small businesses and vendors in Redmond support larger businesses, like Microsoft and Nintendo USA. Small businesses are particularly sensitive to unexpected losses of income. If a small business is forced to close for a few days, it may not be able to reopen. Redmond needs to take additional precautions to support this sector of the economy to avoid a ripple effect: echoing up from smaller businesses to the larger corporations in the area.

1.4 Local Capabilities Assessment and Integration

A capability is defined as a resource or capacity (human, physical, technical, informational, and/or financial) at all levels of government available for mitigation initiatives and efforts. Not only does the City of Redmond have a robust source of internal capabilities, it also has many external capabilities offered through regional planning and coordination.

In **Table 3, Capabilities Inventory**, the following definitions are used:

- *Human capabilities*: people assigned to a department for the purpose of emergency management
- *Physical capabilities*: objects, like seismic ties to reinforce a building from an earthquake, available for emergency management
- *Technical capabilities*: software, hardware, equipment, or tools available for emergency management
- *Financial capabilities*: indicates that the department has or is in the process of acquiring financial resources

To ensure integration of available capabilities they are categorized into the four stages of emergency management: mitigation, preparedness, response and recovery. This classification provides a system to analyze capabilities on multiple levels: jurisdiction, organization and department, capability type, and stage of emergency management. Using this organizational structure, priority capabilities were extracted and a gap analysis was used to identify strengths and weaknesses of Redmond's collection of capabilities.

Based on the inventory of Redmond's capabilities, the top five capabilities of the City include:

- Local Hazardous Waste Management Program
- Redmond Critical Areas Ordinance 2005
- Redmond Downtown Transportation Master Plan
- Washington State Emergency Management Pre-Disaster Mitigation Grant Program
- Emergency Operating Services Agreement with King County Fire Protection District 34.

Table 3, Capabilities Inventory, is a reference matrix of government agency capabilities.

		Human	Physical	Technical	Information	Financial
City	Finance & Information Services					
	Fire Department					
	Human Resources					
	Parks and Recreation					
	Planning and Community Development					
	Police					
	Public Works					
	Communications					
	City Council					
	Department of Transportation					
	Emergency Management					
Regional	Eastside Public Safety Communications Agency					
County	Department of Transportation					
	Office of Emergency Management					
	Sheriff's Office					
	Fire Marshal Division					
	Evergreen Healthcare Hospital District					
	County Library System					
	Solid Waste Division					
	Seattle-King County Department of Public Health					
	King County Library System					
Regional Public Information Network (RPIN)						
State	Department of Transportation					
	Emergency Management Division					
	State Patrol					
	Military Department					
	Urban Search and Rescue					
	State Building Code Council					
	National Guard					
Federal	Small Business Administration					
	FEMA					



- Preparedness
- Response
- Recovery
- Mitigation

Table 3: Capabilities Inventory

1.5 Related Documents

The following is an abbreviated list of documents most relevant to the 2009 City of Redmond Hazards Mitigation Plan. Specific references are included as footnotes throughout the HMP.

Redmond Comprehensive Plan

<http://www.redmond.gov/intheworks/redmond2022/planupdates.asp>
<http://www.redmond.gov/insidcityhall/documentlibrary.asp#Land>

Redmond 2006 Hazard Mitigation Plan

<http://www.redmond.gov/insidcityhall/planning/mitigation/mitigation.asp>

Redmond Critical Area Ordinance

<http://www.redmond.gov/intheworks/criticalareas/>

Redmond Recovery Plan

Contained in this plan as an Annex, see page 199

Redmond Comprehensive Emergency Management Plan

Currently being updated.

King County Hazard Mitigation plan

<http://www.kingcounty.gov/safety/prepare/EmergencyManagementProfessionals/PlansandPrograms/RegionalHazardMitigationPlan.aspx>

State of Washington Military Department, Emergency Management Division: Hazard mitigation Plan

http://www.emd.wa.gov/plans/washington_state_hazard_mitigation_plan.shtml

State of Washington Department of Ecology Shoreline Management Act

<http://www.ecy.wa.gov/programs/sea/SMA/index.html>

FEMA

<http://www.fema.gov/about/divisions/mitigation.shtm>
<http://www.fema.gov/plan/mitplanning/index.shtm>

1.6 City Council Adoption Resolution

FEMA requires that the HMP be adopted by City Council. Below is a draft resolution, the approved resolution should be inserted into the Final copy of the HMP.

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF REDMOND ADOPTING THE CITY OF REDMOND HAZARD MITIGATION PLAN (HMP) UPDATE FOR 2009-2014 AS APPROVED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 requires local government agencies to develop and submit an All-Hazards Mitigation Plan in order to receive future Hazard Mitigation Grant Program Funds; and

WHEREAS, the City has knowledge and experience that the natural and man-made hazard events pose threats to lives and cause damages to property within the City of Redmond; and

WHEREAS, staff working with technical experts and the University of Washington have used available technologies, information, and historical documents to conduct a comprehensive risk reduction analysis process resulting in the preparation of the City of Redmond HMP Update; and

WHEREAS, the HMP Update formalizes that City's comprehensive efforts to make the City safer through preventing damage in the built environment; and

WHEREAS, the HMP builds on the objectives and actions established in the 2004 HMP and the City of Redmond's Comprehensive Plan; and

WHEREAS, the HMP has been reviewed by all relevant departments, boards, committees, and the Governor's Office of Emergency Services; and

WHEREAS, the HMP update was presented to Council and was available for public comment and review for the required time period; and

WHEREAS, approval of the HMP Update by FEMA constitutes formal completion of the plan and establishes eligibility for the City to pursue Hazard Mitigation funds.

NOW, THEREFORE, BE IT RESOLVED that the Redmond City Council does hereby adopt the City of Redmond Hazards Mitigation Plan in accordance with the Federal Disaster Mitigation Act of 2000 thereby meeting the eligibility requirements for the potential receipt of Hazard Mitigation Grant Funds.

1.7 FEMA Approval Letter

The FEMA Approval Letter will be inserted into this HMP once it is received.

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